

# Huntington Harbour Bulkhead Repair Project

**Table 1. Summary of soft bottom habitat impacts and mitigation status, Huntington Harbor Bulkhead Repairs, Huntington Beach, California, March 2008.**

STATUS ISLAND	LAST NAME	SITE ADDRESS	TRACT	LOT	Sheetpile (linear ft)	Impact to Soft Bottom		2:1 Mitigation Area		CDP	USACE
						(m <sup>2</sup> )	(ft <sup>2</sup> )	(m <sup>2</sup> )	(ft <sup>2</sup> )		
Projects Completed in 1999-2006											
HMB	Kompaniez	16581 Carousel Lane	5481	134		6.0	64.6	12.0	129.2	5-98-179	
HMB	Anderson	16682 Wanderer Lane	5481	158		11.4	122.7	22.8	245.4	5-98-201	
HMB	Whyte	16541 Carousel Lane	5481	130	78	7.5	81.0	15.0	162.0	5-98-443	
HMB	Barrad	16551 Carousel Lane	5481	131	60	5.8	62.3	11.6	124.6	5-98-444	
HMB	Gelbard	16575 Ensign Circle	5481	170	18	1.7	18.7	3.4	37.4	5-99-473	
TRN	Jan, Jr.	3431 Sagamore Drive	9347	73	59	5.7	61.3	11.4	122.6	5-00-389	
HMB	Wee	16591 Ensign Circle	5481	173	74	7.4	80.0	14.8	160.0	5-01-062	2000100038-YJC
HMB	Rayhanabad	16591 Carousel Lane	5481	135	50	4.8	51.9	9.6	103.8	5-01-358	200200382-DPS
HMB	McClory*	16531 Carousel Lane**	5481	129	75	7.2	77.9	14.5	155.8	5-02-407	200100038-YJC
DAV		16822 Baruna Lane	5050	5	1.3	0.1	1.3	0.3	3.0	5-03-078	
Total for 1999-2006 Projects			10			57.7	621.7	115.4	1,243.8		
Projects Completed in February 2008											
HMB	Gottlieb	16501 Carousel Lane	5481	126	35	3.4	36.3	6.8	72.6	5-06-436	SPL-2007-736-YJC
HMB	Clark	16601 Carousel Lane	5481	136	50	4.8	51.9	9.6	103.8	5-06-436	SPL-2007-736-YJC
HMB	Baron	16611 Carousel Lane	5481	137	50	4.8	51.9	9.6	103.8	5-06-436	SPL-2007-736-YJC
HMB	Chen	16641 Carousel Lane	5481	140	50	4.8	51.9	9.6	103.8	5-06-436	SPL-2007-736-YJC
HMB	Appel	16651 Carousel Lane	5481	141	50	4.8	51.9	9.6	103.8	5-06-436	SPL-2007-736-YJC
HMB	Schuster	16661 Carousel Lane	5481	142	50	4.8	51.9	9.6	103.8	5-06-436	SPL-2007-736-YJC
HMB	Faber	16671 Carousel Lane	5481	143	50	4.8	51.9	9.6	103.8	5-06-436	SPL-2007-736-YJC
HMB	Brault	16681 Carousel Lane	5481	144	50	4.8	51.9	9.6	103.8	5-06-436	SPL-2007-736-YJC
HMB	DeAlmeida	16711 Carousel Lane	5481	147	20	2.0	20.8	4.0	41.5	5-06-436	SPL-2007-736-YJC
HMB	Lady Jr.	16741 Carousel Lane	5481	150	65	6.3	67.5	12.6	135.0	5-06-436	SPL-2007-736-YJC
HMB	Woods, Jr.	16752 Wanderer Lane	5481	151	75	7.2	77.9	14.4	155.8	5-06-436	SPL-2007-736-YJC
TRN	McInally	3382 Venture Drive	8636	10	12	0.2	2.1	0.4	4.2	5-06-436	SPL-2007-736-YJC
TRN	Reda	3372 Venture Drive	8636	11	6	0.0	0	0.0	0.0	5-06-436	SPL-2007-736-YJC
TRN	Lambert	3362 Venture Drive	8636	12	18	1.7	16.5	3.4	33.0	5-06-436	SPL-2007-736-YJC
TRN	Younessi	3352 Venture Drive	8636	13	24	0.1	1.0	0.2	2.0	5-06-436	SPL-2007-736-YJC
TRN	Deasy	3392 Venture Drive	8636	19	6	0.6	6.2	1.2	12.4	5-06-436	SPL-2007-736-YJC
TRN	Cohn	16281 Typhoon Lane	8636	23	35	3.1	33.2	6.2	66.4	5-06-436	SPL-2007-736-YJC
TRN	Uva	3421 Sagamore Drive	9347	72	12	1.2	12.5	2.4	25.0	5-06-436	SPL-2007-736-YJC
HMB	Goss	16691 Carousel Lane	5481	145	50	4.8	51.9	9.6	103.8	5-06-438	SPL-2007-736-YJC
HMB	Vaughan	16731 Carousel Lane	5481	149	60	5.8	62.3	11.6	124.6	5-06-438	SPL-2007-736-YJC
TRN	Rayhan	3612 Venture Drive	9168	69	15	1.4	15.6	2.8	31.2	5-06-438	SPL-2007-736-YJC
TRN	Daniels	3602 Venture Drive	9168	70	14	1.3	14.5	2.6	29.0	5-06-438	SPL-2007-736-YJC
TRN	Dauger	3582 Venture Drive	9335	46	6	0.6	6.2	1.2	12.4	5-06-438	SPL-2007-736-YJC
Total for February 2008 Projects			23			73.3	787.8	146.6	1,575.5		
Totals			33			130.9	1409.5	261.9	2,819		
Bolsa Chica Mitigation Area (CDP 5-01-020)									5,358		
Mitigation Area Remaining as of March 2008									2,539		

\* Actual impacts are listed for completed projects. Some properties in CDP 5-00-389 had no sheetpile installed.

\*\* Sheetpile was installed at 16531 Carousel under emergency permit 5-02-407, Pending permit 5-06-436 for this property is under new homeowner and is for rock installation aspect only.

Notes: CDPs 5-98-179 & 5-98-201 bulkhead repair permitting by Cash & Associates;  
CDP 5-03-078 bulkhead repair permitting by homeowner.

The following properties in CDP 5-06-436 (Tract-Lot) had sheetpile installed with no impact to soft bottom habitat due to pre-existing conditions of overspilled concrete in front of the footing: 8636-5, 8636-7, 8636-14, 8636-15; 8636-16.

TC 13534  
May 2008



# **Davenport Bulkhead Repair Group Eelgrass Survey**

May 2008

Huntington Harbour  
Huntington Beach, California

Prepared For:  
City of Huntington Beach

Prepared By:  
Tetra Tech, Inc.  
401 E. Ocean Blvd., Ste. 420  
Long Beach, California 90802



ATTACHMENT NO. 10.1

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### APPENDICES

Appendix A	Eelgrass Survey Area Diagrams for each Property Surveyed
Appendix B	Southern California Mitigation Policy (Rev. 11)

## INTRODUCTION

In conjunction, 30 homeowners on Davenport Island, Humboldt Island, Trinidad Island, Gilbert Island, and the mainland in Huntington Harbour (Figure 1) intend to have the bulkheads adjacent to their properties repaired and subsequently protected by the placement of rock. By design, this rock would extend to a maximum of 6 feet from the existing bulkhead. In order to determine the impact this project would have on eelgrass (*Zostera marina*) Tetra Tech, Inc. was contracted to conduct an eelgrass survey. This eelgrass survey was conducted and prepared in compliance with the "Southern California Eelgrass Mitigation Policy" Revision 11.

Eelgrass habitat has been identified as a sensitive marine resource by the California Department of Fish and Game, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service. Eelgrass beds serve as refuges, foraging areas, and nursery habitats for various coastal and bay invertebrates and fishes. Eelgrass grows from the low tide level to a maximum depth of approximately 20 feet.

## METHODS

One scientific diver, experienced in eelgrass ecology and able to identify *Caulerpa taxifolia*, conducted an eelgrass mapping survey in Huntington Harbour adjacent to the 30 properties on May 23rd and May 24th, 2008. The area surveyed was from the seawall out 12 meters (39.4 feet). The properties are located throughout Huntington Harbour in Huntington Beach, California (Figures 2 through 7).

Separate surveys were conducted for each property (Appendix A). At the start of each survey property lines were determined by the fence line dividing adjacent properties. The boundaries of any eelgrass beds were measured in distance from the bulkhead in feet and the tape was then moved over in 5-ft increments and eelgrass was measured along each transect. Transects were run parallel to the bulkhead at distances of five feet apart. During the survey, underwater visibility was approximately 3 to 5 feet. Depths in the area surveyed ranged from 0 ft to -10 ft mean lower low water. For sites where eelgrass was found, the information on the area surveyed was digitally plotted, to scale, using AutoCAD software.

## RESULTS

Tables 1 and 2 below summarizes the survey results. No eelgrass (*Zostera marina*) was found within 6 feet of the bulkheads at any of the properties surveyed. In addition, no eelgrass was found in the area adjacent to (within 12 meters) to 29 of the 30 properties. At one property, 3432 Venture Drive (Tract 8636 Lot 6), an 11 square foot patch of eelgrass was found as shown in the attached Figure 8. The landward edge of this eelgrass patch is located 8 to 8.5 feet from the bulkhead. In addition, the diver surveyed for *Caulerpa taxifolia*, which was not observed in any of the areas surveyed.



**Table 1. Eelgrass area at properties in the Davenport Bulkhead Repair Group, Huntington Beach, California, May 2008.**

Property Address	Tract Number	Lot Number	Eelgrass Area			
					Survey Zone	
			Total (m <sup>2</sup> )	Total (ft <sup>2</sup> )	6-ft (impact) (m <sup>2</sup> )	10-m (m <sup>2</sup> )
16771 Bolero Lane	5050	51	0	0	0	0
3432 Venture Drive	8636	6	3.35	11.00	0	3.35
3481 Sagamore Drive	9347	77	0	0	0	0
4012 Morning Star Drive	5360	72	0	0	0	0
4001 Morning Star Drive	5360	74	0	0	0	0
16842 Baruna Lane	5050	3	0	0	0	0
3781 Ragtime Circle	9168	29	0	0	0	0
17011 Bolero Lane	5264	35	0	0	0	0
16492 Somerset Lane	4677	44	0	0	0	0
4151 Morning Star Drive	5360	88	0	0	0	0
4041 Morning Star Drive	5360	77	0	0	0	0
16611 Nalu Circle	5050	31	0	0	0	0
3741 Nimble Circle	9168	40	0	0	0	0
16612 Nalu Circle	5050	26	0	0	0	0
4002 Morning Star Drive	5360	73	0	0	0	0
16862 Baruna Lane	5050	1	0	0	0	0
16852 Baruna Lane	5050	2	0	0	0	0
16777 Bolero Lane	5050	52	0	0	0	0
4181 Morning Star Drive	5360	90	0	0	0	0
16572 Ensign Circle	5481	179	0	0	0	0
4171 Morning Star Drive	5360	89	0	0	0	0
16631 Bolero Lane	5050	33	0	0	0	0
4021 Morning Star Drive	5360	75	0	0	0	0
4141 Morning Star Drive	5360	87	0	0	0	0
16661 Bolero Lane	5050	36	0	0	0	0
16891 Bolero Lane	5264	47	0	0	0	0
4031 Morning Star Drive	5360	76	0	0	0	0
16781 Bolero Lane	5050	53	0	0	0	0
4022 Morning Star Drive	5360	71	0	0	0	0
17019 Edgewater Lane	4880	24	0	0	0	0
Total			3.35	11.00	0	3.35



## **DISCUSSION**

The area of potential eelgrass habitat within the survey area is limited by factors such as shading, which is due to the island itself, and the location of docks. All properties surveyed had associated docks, which directly shaded portions of the area in front of the bulkhead thus precluding eelgrass growth. The shape of many of the eelgrass beds is a direct result of the configuration of the docks. Water clarity and tidal circulation also affect the ability of eelgrass to grow in an area. The visibility observed during previous surveys was between 3 and 10 feet, which is typical for the area. Tidal circulation in the inlets of the island is reduced which decreases the potential for eelgrass growth. It appears that eelgrass habitat is limited to the areas where eelgrass already occurs (pers. comm., Hoffman 1999). The areas where eelgrass does not occur are unsuitable for eelgrass due to the above mentioned factors.

Based on the current findings, the rock placed along the bulkhead will not impact eelgrass at any of the 30 properties. However, one property has eelgrass within 8 feet of the bulkhead and care must be taken to avoid impacting this eelgrass (Figure 8).

## **CONCLUSION**

Only one 11 square foot patch of eelgrass is located in the areas surveyed for the proposed project. Design and construction methods can be employed to avoid impacting this eelgrass. Prior to the project a pre-construction eelgrass survey will be conducted to confirm that no impacts will occur as a result of the project.

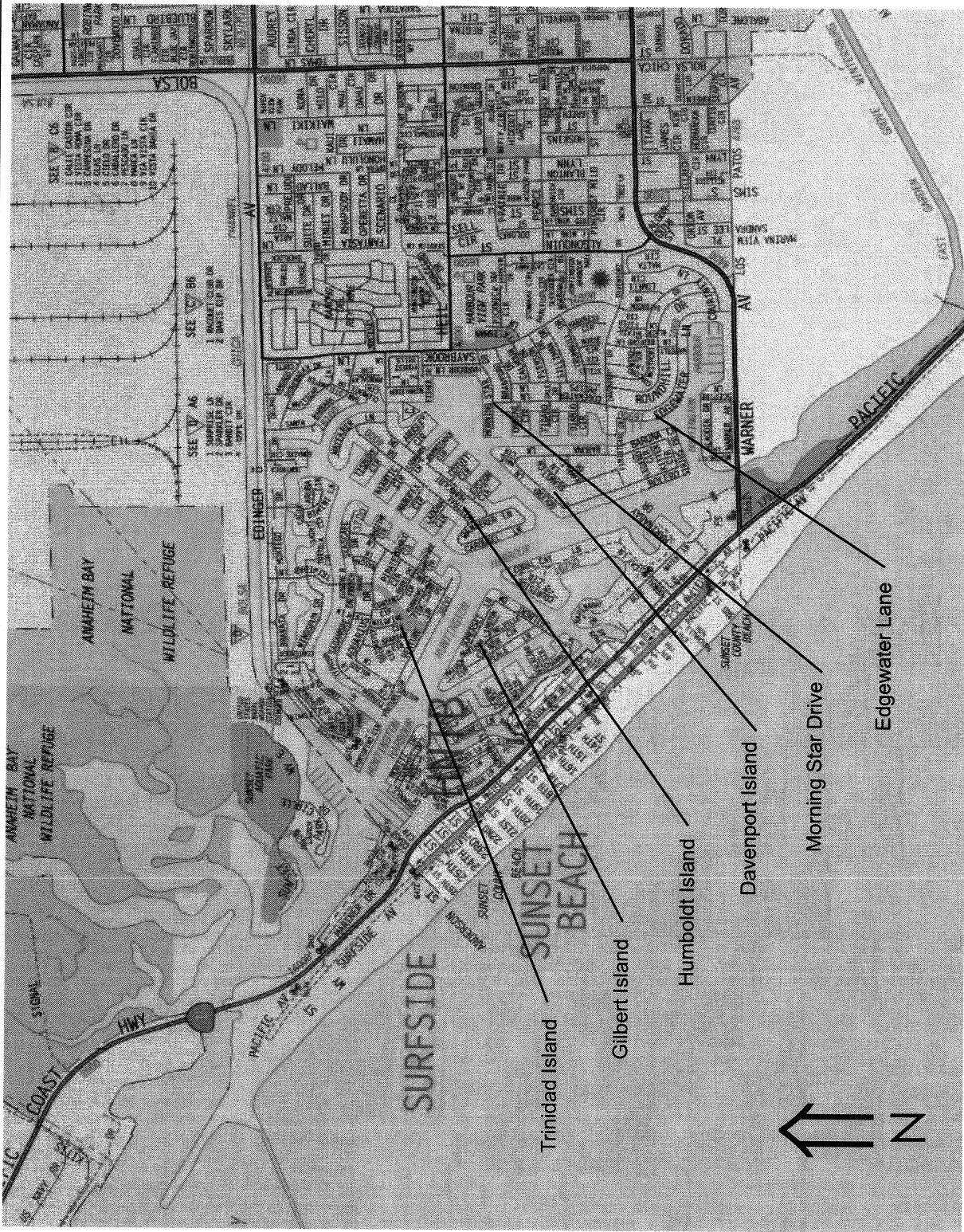
Any reduction in acreage of eelgrass habitat must be mitigated according to State and Federal environmental policies, which include the replacement, in kind, of these habitat types. A copy of the *Southern California Eelgrass Mitigation Policy* is included in Appendix B.



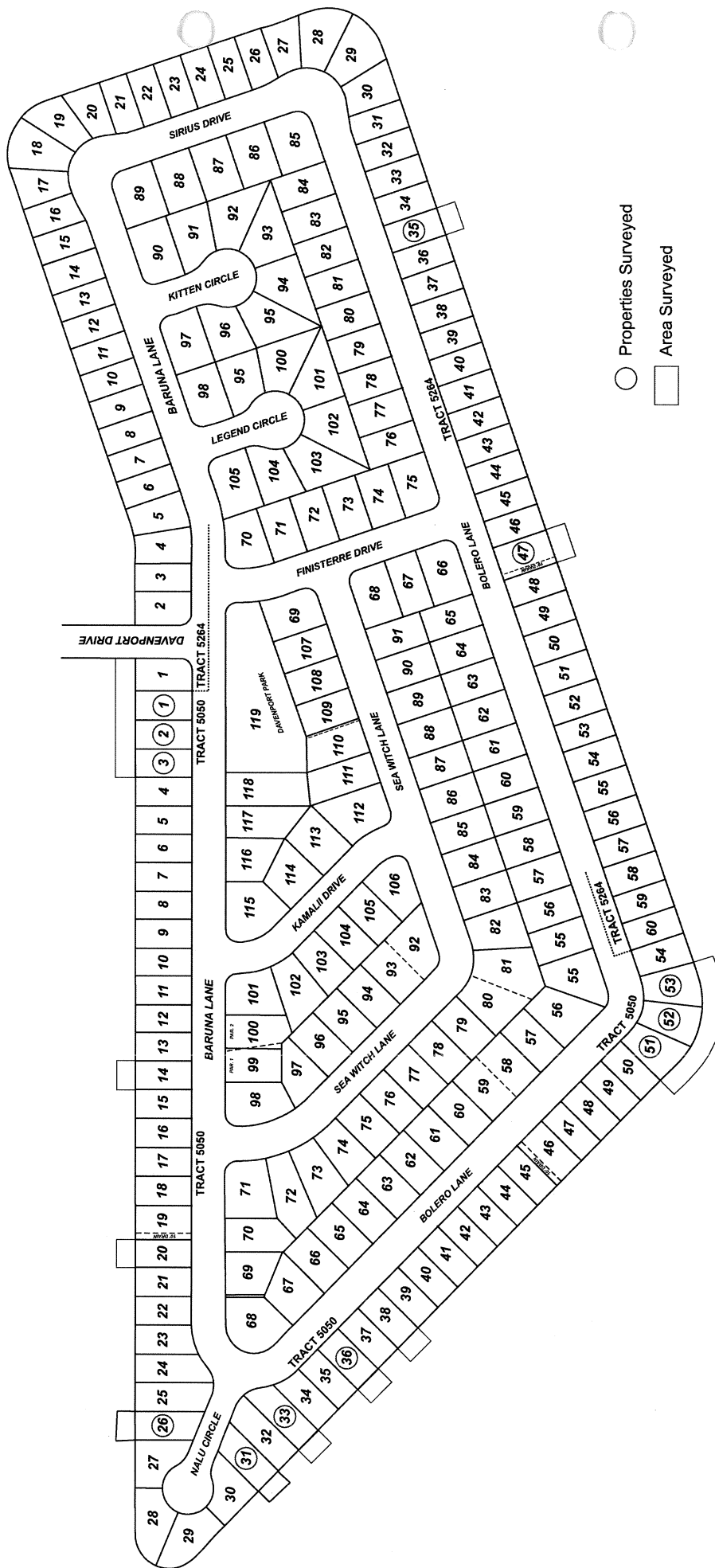
Vicinity Map  
Davenport Bulkhead Repair Group

Source: Thomas Bros. Maps

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Ph. (562) 495-0495 Fax (562) 495-5029





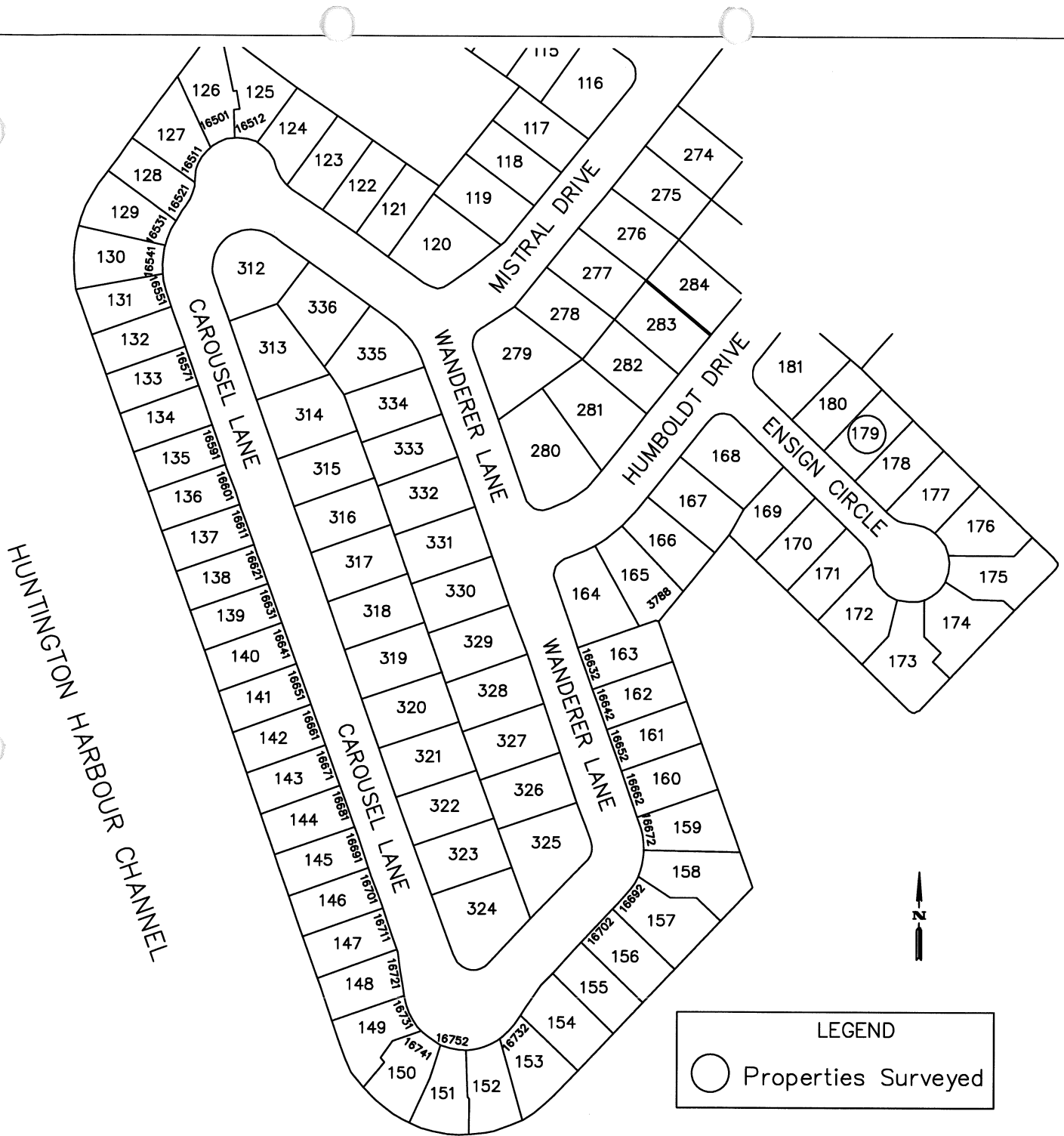


May 2008  
Figure 2

Davenport Island  
Huntington Beach, California

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401 East Ocean Blvd., Suite 420  
Long Beach, California 90802  
Ph. (562) 495-0495 Fax (562) 495-5029





# Humboldt Island Huntington Beach, California

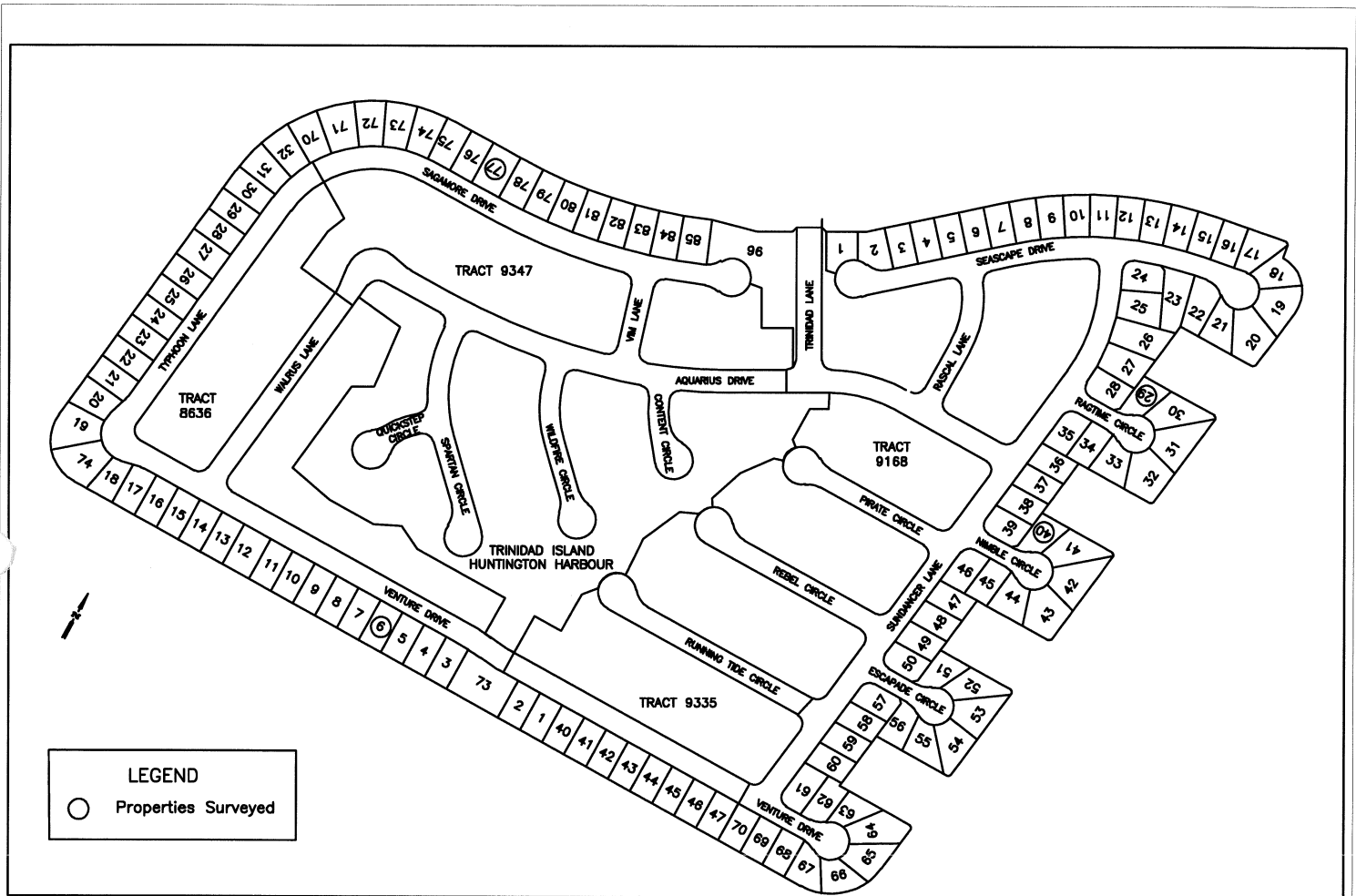


**TETRA TECH**

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May 2008  
Figure 3

ATTACHMENT NO. 10.9

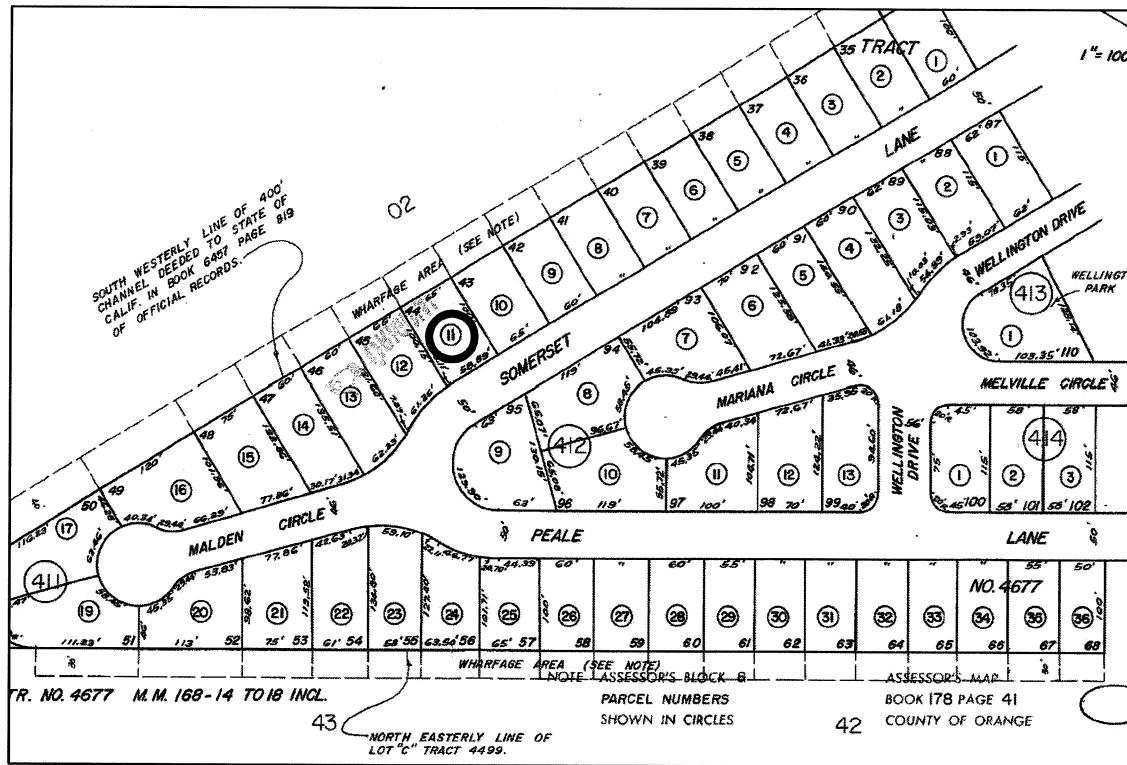


**TETRA TECH**  
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 Long Beach, CA 90802  
 (562) 495-0495, Fax (562) 495-5029

Trinidad Island  
 Huntington Beach, California

May 2008  
 Figure 4

ATTACHMENT NO. 10.10



LEGEND

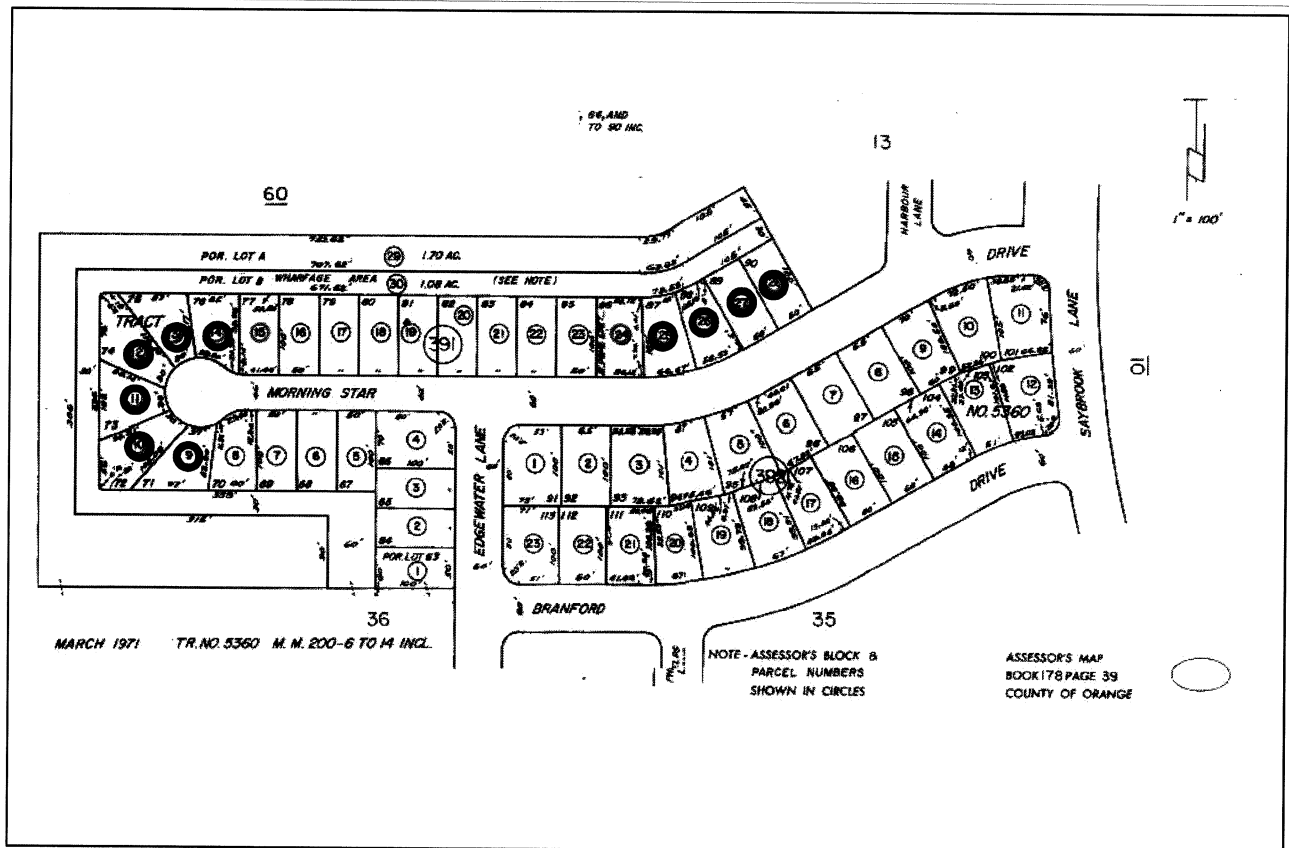
○ Properties Surveyed

**TETRA TECH**  
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Gilbert Island  
 Huntington Beach, California

May 2008  
 Figure 5

ATTACHMENT NO. 10.11



#### LEGEND

○ Properties Surveyed



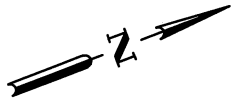
**TETRA TECH**  
401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Morning Star Drive  
Huntington Beach, California

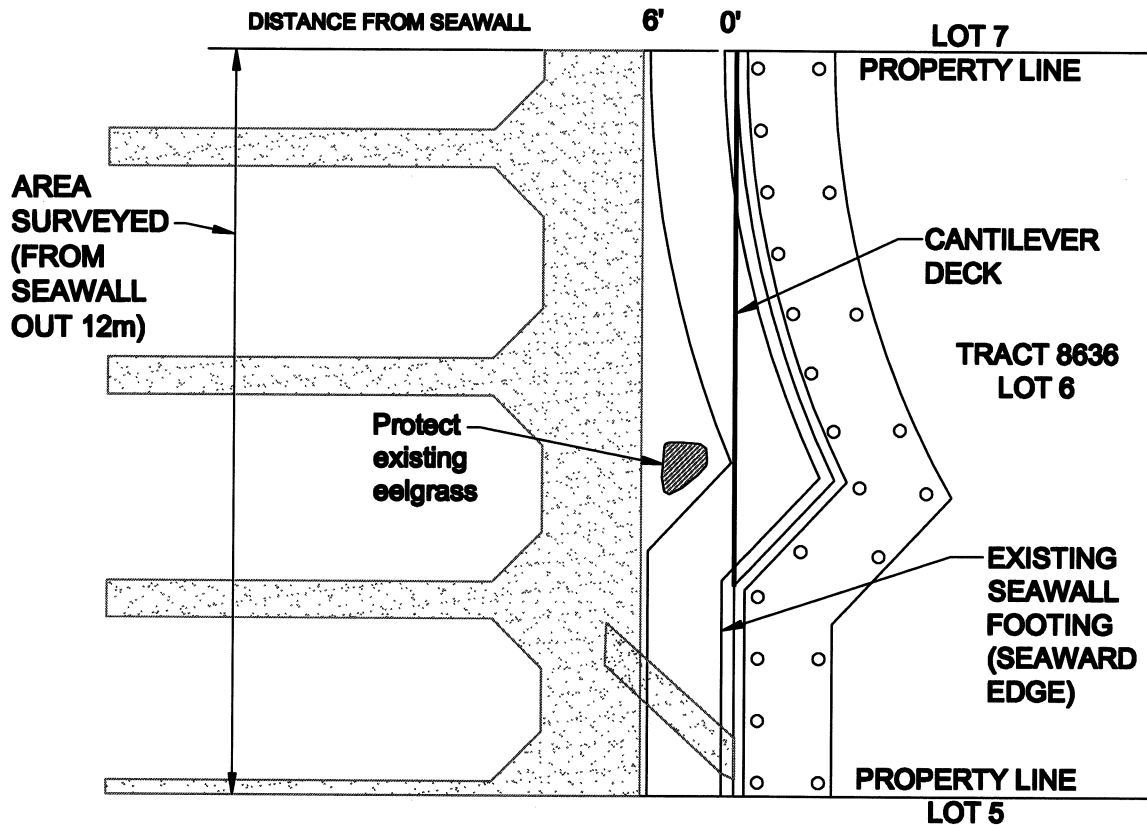
May 2008  
Figure 6

ATTACHMENT NO. 10.12





HUNTINGTON HARBOUR CHANNEL



**LEGEND:**

-  Eelgrass 05/24/08 (11ft sq)  
No *Caulerpa taxifolia*

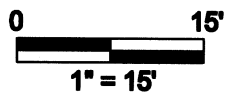


**TETRA TECH**

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Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-8029

Datum: MLLW = 0

PLAN VIEW



Eelgrass Survey Results  
Survey Conducted: 05/24/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Trinidad Island  
Tract 8636 Lot 6

Isaac Azoulay  
3432 Venture Drive  
Huntington Beach, CA 92649

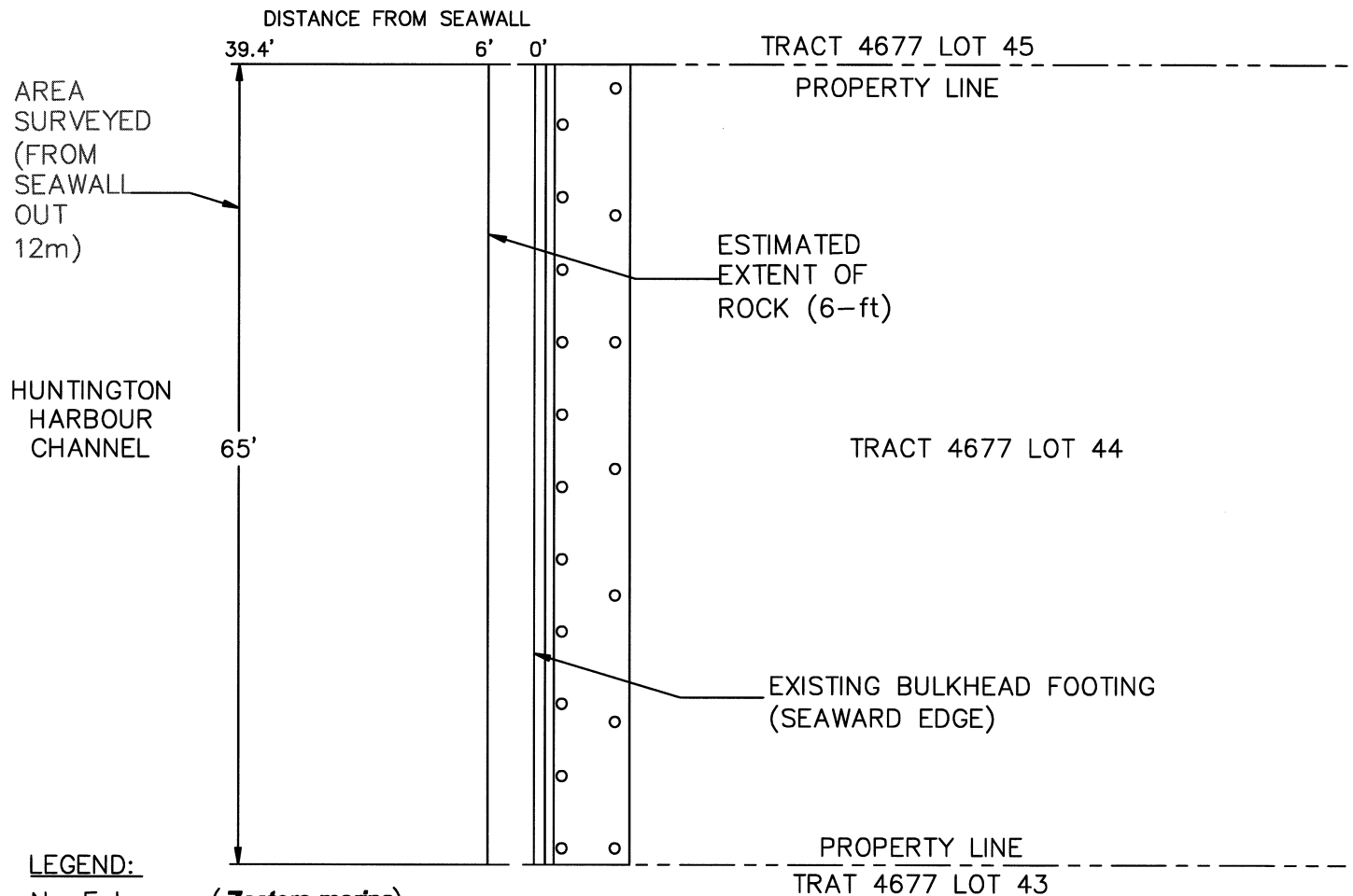
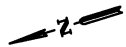
ATTACHMENT NO. 10.14

**APPENDIX A**

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**Eelgrass Survey Diagrams for each Property**





**LEGEND:**

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

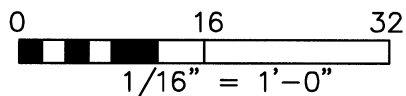


**TETRA TECH**

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Datum: MLLW = 0

**PLAN VIEW**



Don Goodwin  
16492 Somerset Lane  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 4677 Lot 44

ATTACHMENT NO. 10.16

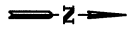
DISTANCE FROM SEAWALL

39.4'

6' 0'

TRACT 4880 LOT 23

PROPERTY LINE



AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

HUNTINGTON  
HARBOUR  
CHANNEL

TRACT 4880 LOT 24

54'-1"

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

LEGEND:

No Eelgrass (*Zostera marina*)

No *Caulerpa taxifolia*

PROPERTY LINE

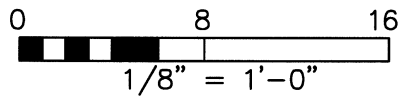
TRACT 4880 LOT 25



TETRA TECH

Datum: MLLW = 0

PLAN VIEW



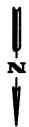
Don and Rosa Diaz Zimmerman  
17019 Edgewater Lane  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 4880 Lot 24

ATTACHMENT NO. 10.17



DISTANCE FROM SEAWALL

39.4'

6' 0'

TRACT 5624 LOT 1

PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

HUNTINGTON  
HARBOUR  
CHANNEL

50'-0"

TRACT 5050 LOT 1

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

PROPERTY LINE

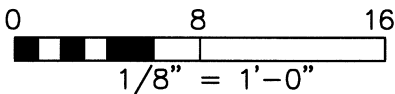
TRACT 5050 LOT 2



TETRA TECH

Datum: MLLW = 0

PLAN VIEW



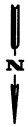
Christian Nielsen  
16862 Baruna Lane  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5050 Lot 1

ATTACHMENT NO. 10-18



DISTANCE FROM SEAWALL

39.4'

6' 0'

TRACT 5050 LOT 1

PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

HUNTINGTON  
HARBOUR  
CHANNEL

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

TRACT 5050 LOT 2

50'-0"

LEGEND:

No Eelgrass (*Zostera marina*)

No *Caulerpa taxifolia*

EXISTING BULKHEAD  
FOOTING  
(SEAWARD EDGE)

PROPERTY LINE

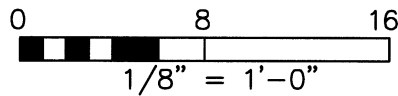
TRACT 5050 LOT 3



TETRA TECH

Datum: MLLW = 0

PLAN VIEW



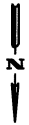
Christian Nielsen  
16852 Baruna Lane  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 5050 Lot 2

ATTACHMENT NO. 10.19



DISTANCE FROM SEAWALL  
39.4' 6' 0'

TRACT 5050 LOT 2

PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

HUNTINGTON  
HARBOUR  
CHANNEL

50'-0"

TRACT 5050 LOT 3

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

EXISTING BULKHEAD  
FOOTING  
(SEAWARD EDGE)

PROPERTY LINE

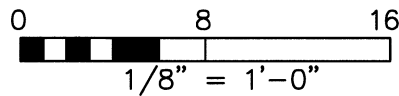
TRACT 5050 LOT 4



TETRA TECH

Datum: MLLW = 0

PLAN VIEW



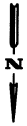
Tad Fujioka  
16842 Baruna Lane  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 5050 Lot 3

ATTACHMENT NO. 10-20



DISTANCE FROM SEAWALL

39.4'

6'

0'

TRACT 5050 LOT 25

PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

HUNTINGTON  
HARBOUR  
CHANNEL

50'-0"

TRACT 5050 LOT 26

LEGEND:

No Eelgrass (*Zostera marina*)

No *Caulerpa taxifolia*

EXISTING BULKHEAD  
FOOTING  
(SEAWARD EDGE)

PROPERTY LINE

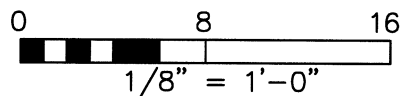
TRACT 5050 LOT 27



TETRA TECH

Datum: MLLW = 0

PLAN VIEW



Richard Mulvania  
16612 Nalu Circle  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 5050 Lot 26

ATTACHMENT NO. 10.21



AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

HUNTINGTON  
HARBOUR  
CHANNEL

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

DISTANCE FROM SEAWALL

39.4'

6' 0"

LOT 30

PROPERTY LINE

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

50'-0"

LOT 31

EXISTING BULKHEAD  
FOOTING  
(SEAWARD EDGE)

PROPERTY LINE  
LOT 32

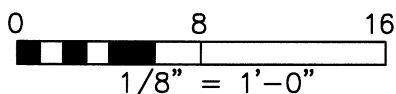


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



Oren & Carol Langston  
16611 Nalu Circle  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5050 Lot 31

ATTACHMENT NO. 10.22

DISTANCE FROM SEAWALL  
39.4' 6' 0'

TRACT 5050 LOT 32  
PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

HUNTINGTON  
HARBOUR  
CHANNEL

50'-0"

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

TRACT 5050 LOT 33

EXISTING BULKHEAD  
FOOTING  
(SEAWARD EDGE)

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

PROPERTY LINE  
TRACT 5050 LOT 34

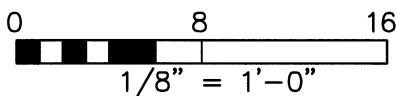


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



William & Joyce Ritchie  
16631 Bolero Lane  
Huntington Beach, CA 92649

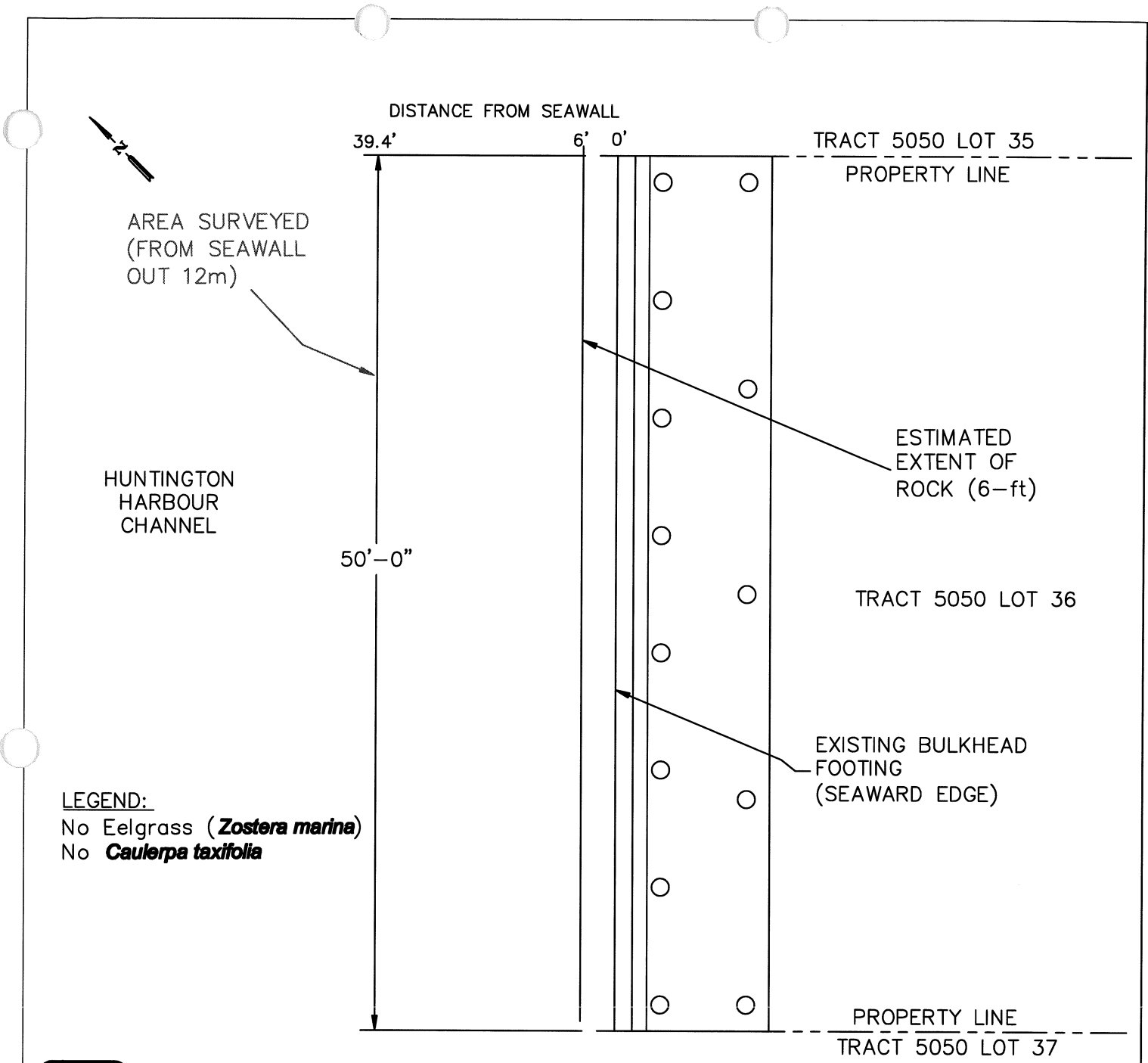
Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 5050 Lot 33

ATTACHMENT NO. 1023

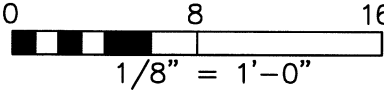


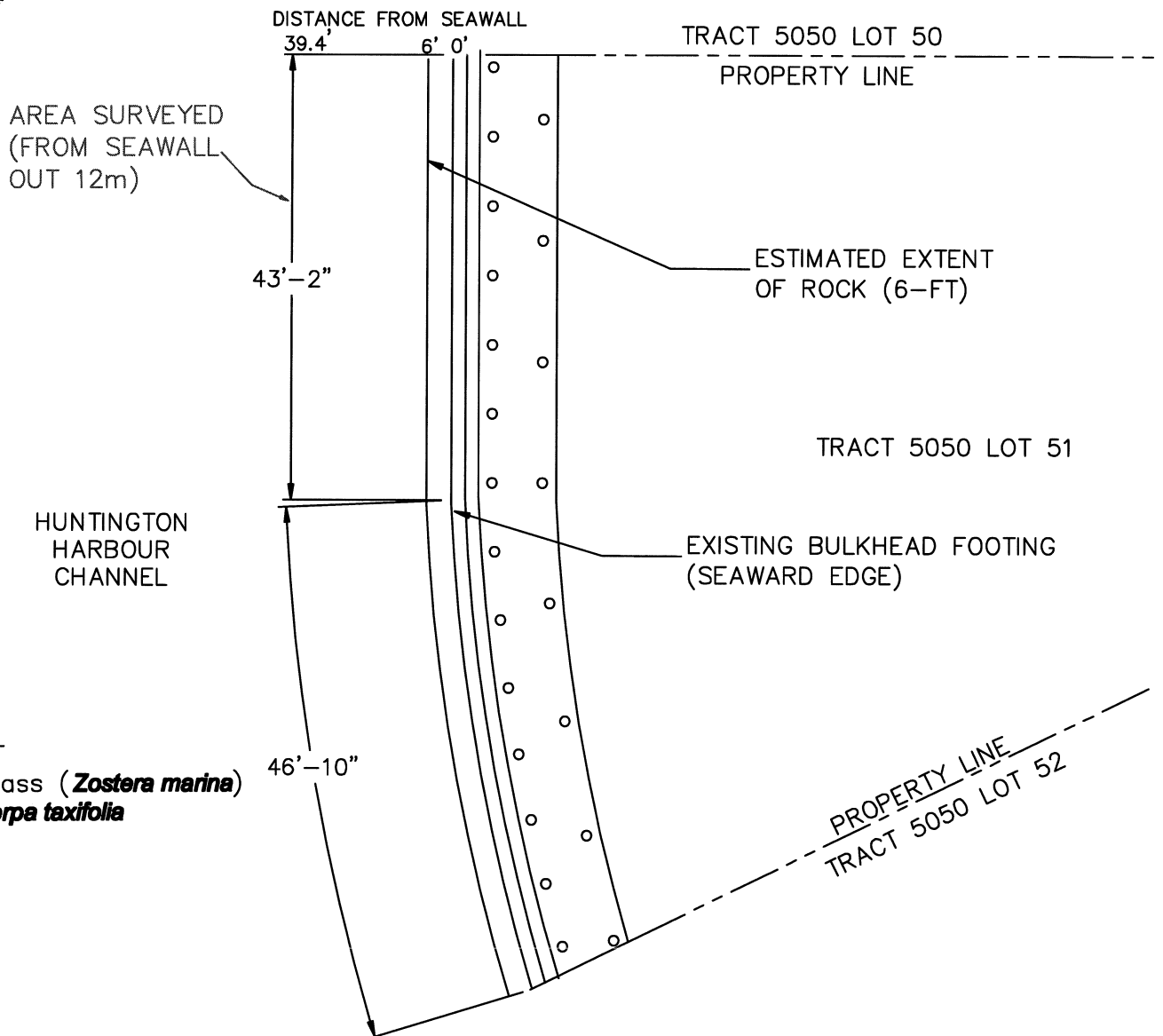


**LEGEND:**  
 No Eelgrass (*Zostera marina*)  
 No *Caulerpa taxifolia*



**TETRA TECH**  
 401 East Ocean Blvd., Suite 420  
 Long Beach, CA 90802  
 (562) 495-0495, Fax (562)495-5029

Datum: MLLW = 0  Tract 5050 Lot 36	<p>PLAN VIEW</p>  <p>1/8" = 1'-0"</p> <p>Gilbert &amp; Rory Unatin          16661 Bolero Lane          Huntington Beach, CA 92649</p>	<p>Eelgrass Survey Results          Survey Conducted: 05/23/08</p> <p>IN: Huntington Harbour          AT: Huntington Beach          County of Orange State: CA</p>
--	--	--



LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

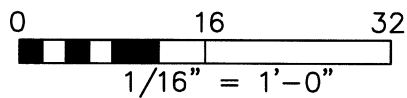


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



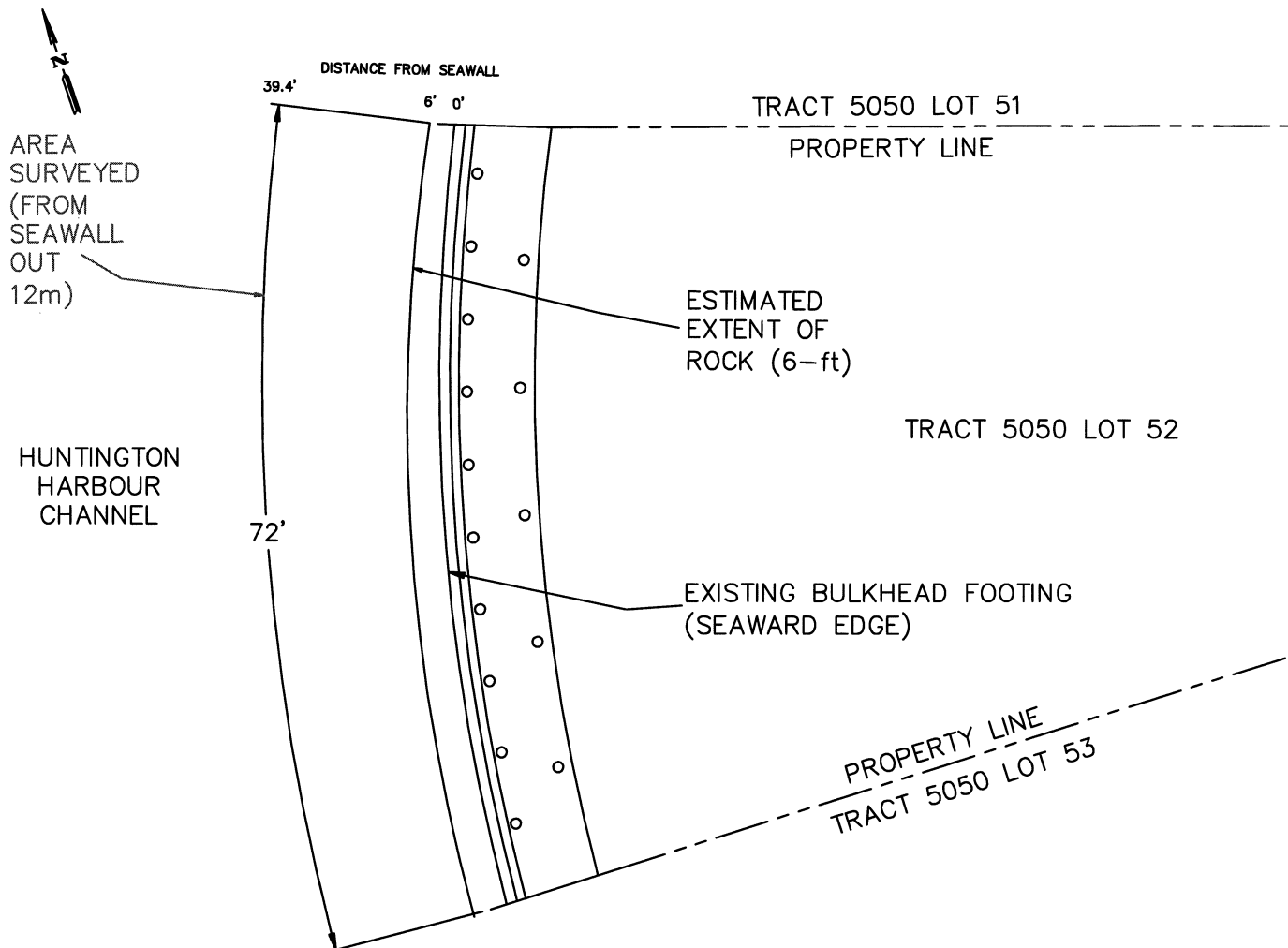
John Stanko & Sharon Appel  
16771 Bolero Lane  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5050 Lot 51

ATTACHMENT NO. 1025



LEGEND:

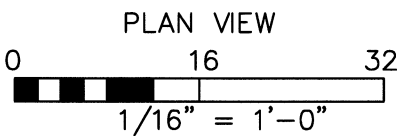
No Eelgrass (*Zostera marina*)  
 No *Caulerpa taxifolia*



**TETRA TECH**

401 East Ocean Blvd., Suite 420  
 Long Beach, CA 90802  
 (562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0



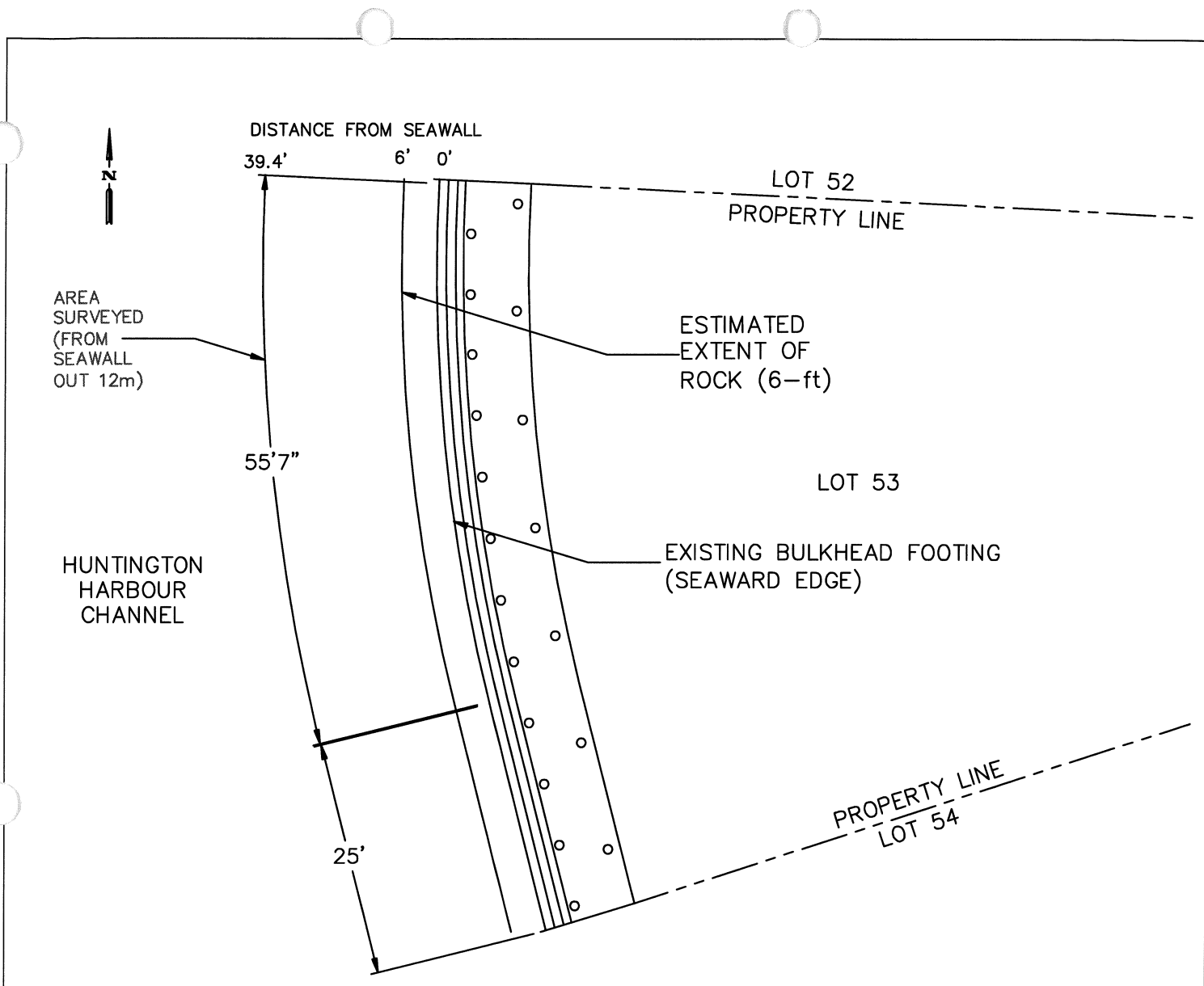
Walter Nisbet  
 16777 Bolero Lane  
 Huntington Beach, CA 92649

Eelgrass Survey Results  
 Survey Conducted: 05/23/08

IN: Huntington Harbour  
 AT: Huntington Beach  
 County of Orange State: CA

Tract 5050 Lot 52

ATTACHMENT NO. 10.26



LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

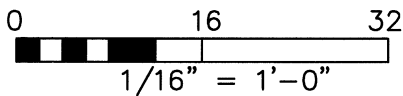


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



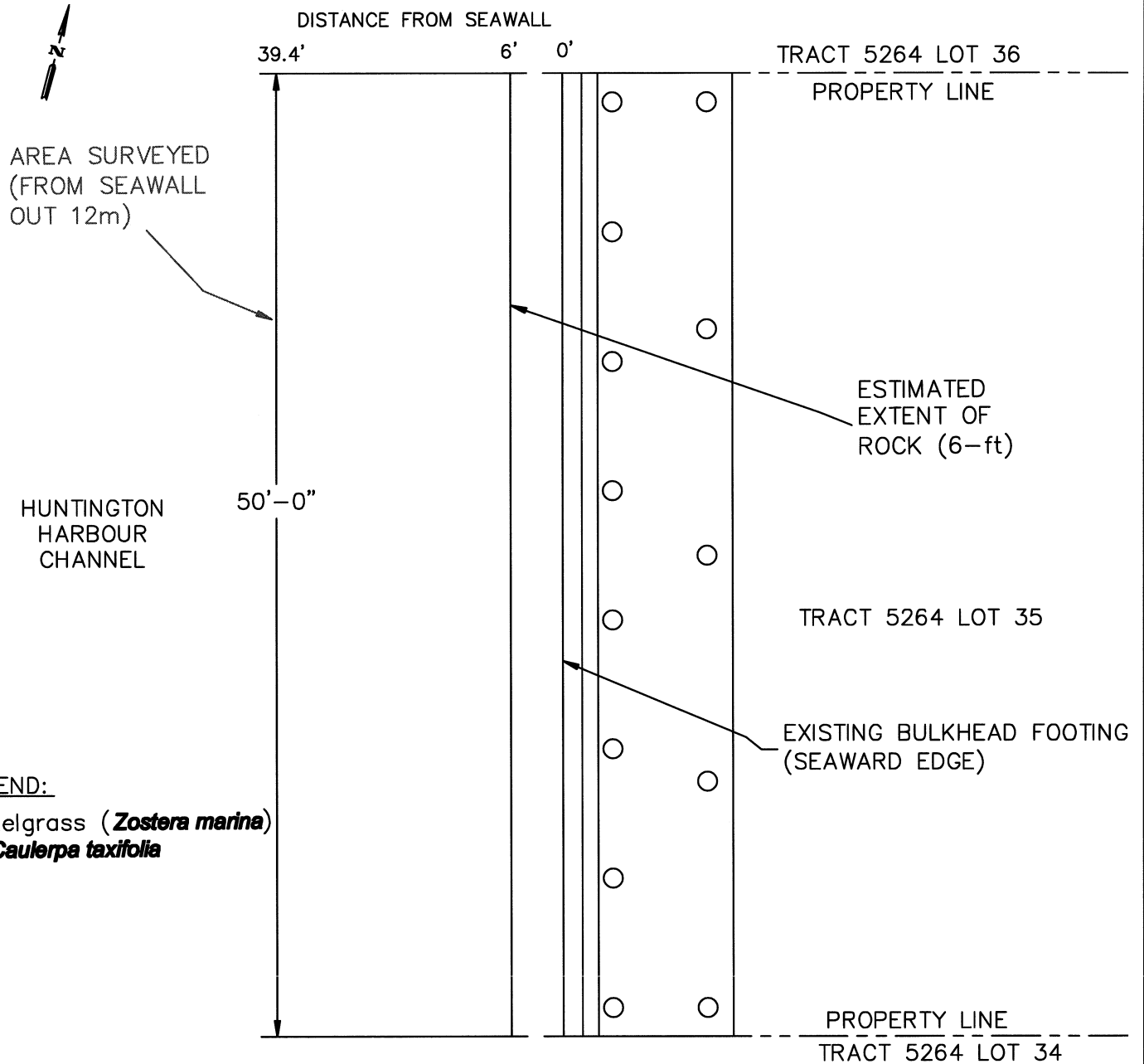
Michael Woods  
16781 Bolero Lane  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5050 Lot 53

ATTACHMENT NO. 10.27

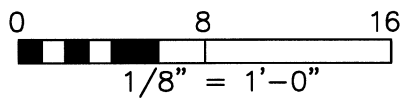


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
 Long Beach, CA 90802  
 (562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



Samuel Giesy  
 17011 Bolero Lane  
 Huntington Beach, CA 92649

Eelgrass Survey Results  
 Survey Conducted: 05/23/08

IN: Huntington Harbour  
 AT: Huntington Beach  
 County of Orange State: CA

Tract 5264 Lot 35

ATTACHMENT NO. 10-28

DISTANCE FROM SEAWALL

39.4'

6' 0'

TRACT 5264 LOT 48

PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

HUNTINGTON  
HARBOUR  
CHANNEL

60'-0"

TRACT 5264 LOT 47

LEGEND:

No Eelgrass (*Zostera marina*)

No *Caulerpa taxifolia*

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)



**TETRA TECH**

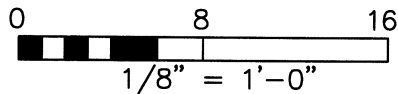
401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562)495-5029

PROPERTY LINE

TRACT 5264 LOT 46

Datum: MLLW = 0

PLAN VIEW



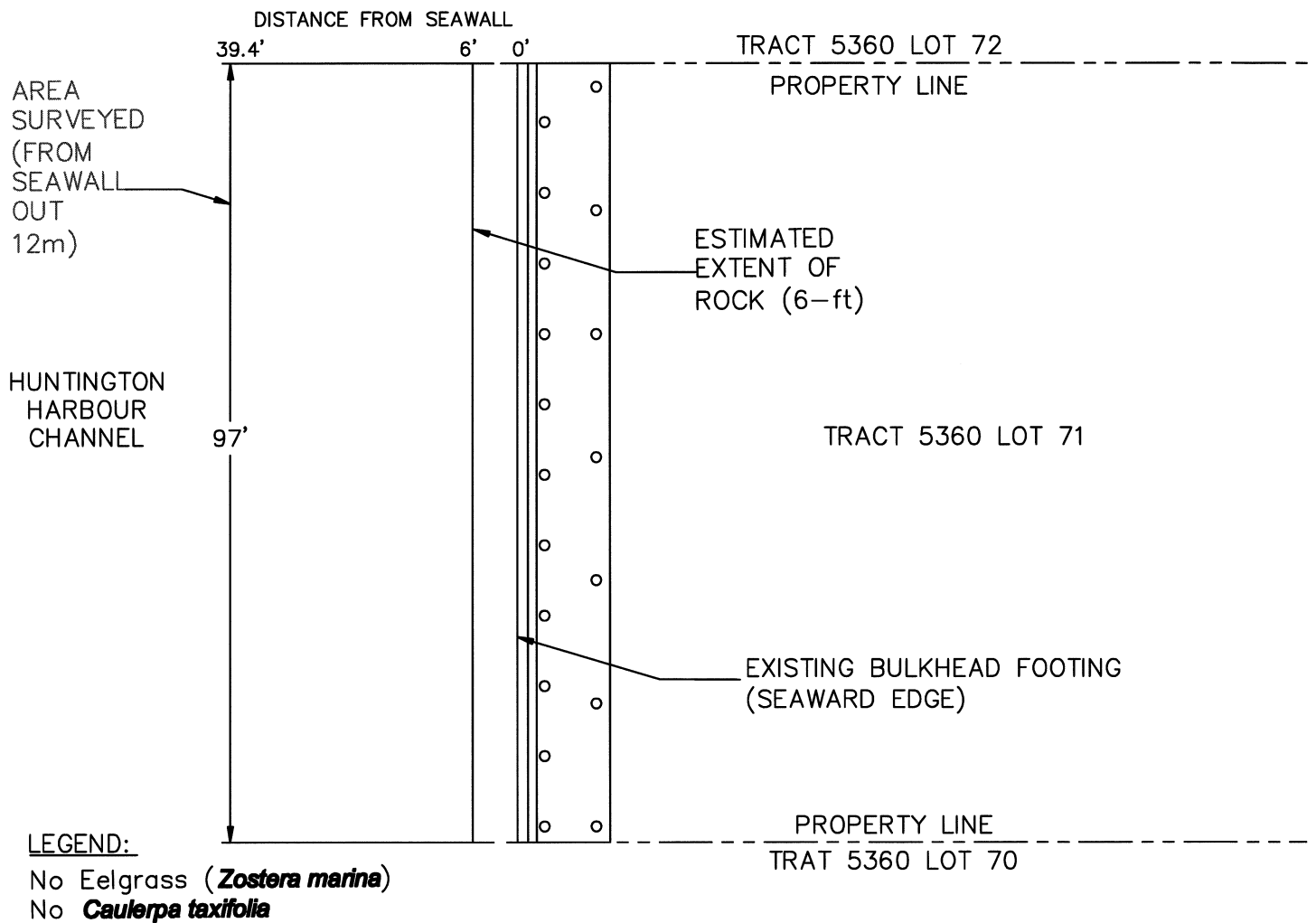
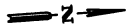
Ing Wong  
16891 Bolero Lane  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5264 Lot 47

ATTACHMENT NO. 10-29

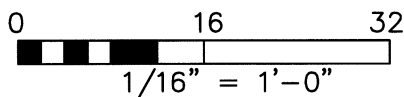


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



Mike Younessi  
4022 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5360 Lot 71

ATTACHMENT NO. 10.30



AREA  
SURVEYED  
(FROM  
SEAWALL  
OUT  
12m)

HUNTINGTON  
HARBOUR  
CHANNEL

DISTANCE FROM SEAWALL

39.4'

6' 0"

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

TRACT 5360 LOT 73  
PROPERTY LINE

TRACT 5360 LOT 72

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

PROPERTY LINE  
TRACT 5360 LOT 71

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

6'

32'

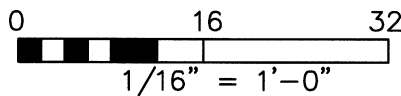


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



Tobin Campbell  
4012 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5360 Lot 72

ATTACHMENT NO. 10.31





AREA  
SURVEYED  
(FROM  
SEAWALL  
OUT  
12m)

HUNTINGTON  
HARBOUR  
CHANNEL

DISTANCE FROM SEAWALL  
39.4' 6' 0'

102'

TRACT 5360 LOT 74  
PROPERTY LINE

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

TRACT 5360 LOT 73

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

PROPERTY LINE  
TRACT 5360 LOT 72

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

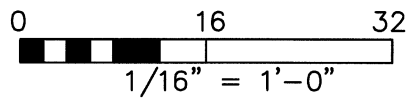


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



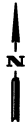
Michael Myers & Pamela Rieder  
4002 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 5360 Lot 73

ATTACHMENT NO. 10.32



AREA  
SURVEYED  
(FROM  
SEAWALL  
OUT  
12m)

HUNTINGTON  
HARBOUR  
CHANNEL

76'

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

TRACT 5360 LOT 75  
PROPERTY LINE

TRACT 5360 LOT 74

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

39.4' 6' 0'  
DISTANCE FROM SEAWALL

PROPERTY LINE  
TRACT 5360 LOT 73

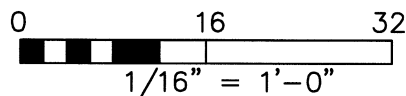


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



Tobin Campbell  
4001 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5360 Lot 74

ATTACHMENT NO. 10.33

DISTANCE FROM SEAWALL  
39.4' 6' 0'

TRACT 5360 LOT 76

PROPERTY LINE

AREA  
SURVEYED  
(FROM  
SEAWALL  
OUT  
12m)

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

HUNTINGTON  
HARBOUR  
CHANNEL

87'

TRACT 5360 LOT 75

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

PROPERTY LINE  
TRACT 5360 LOT 74

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

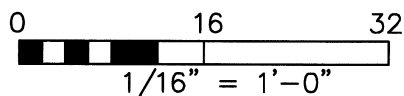


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



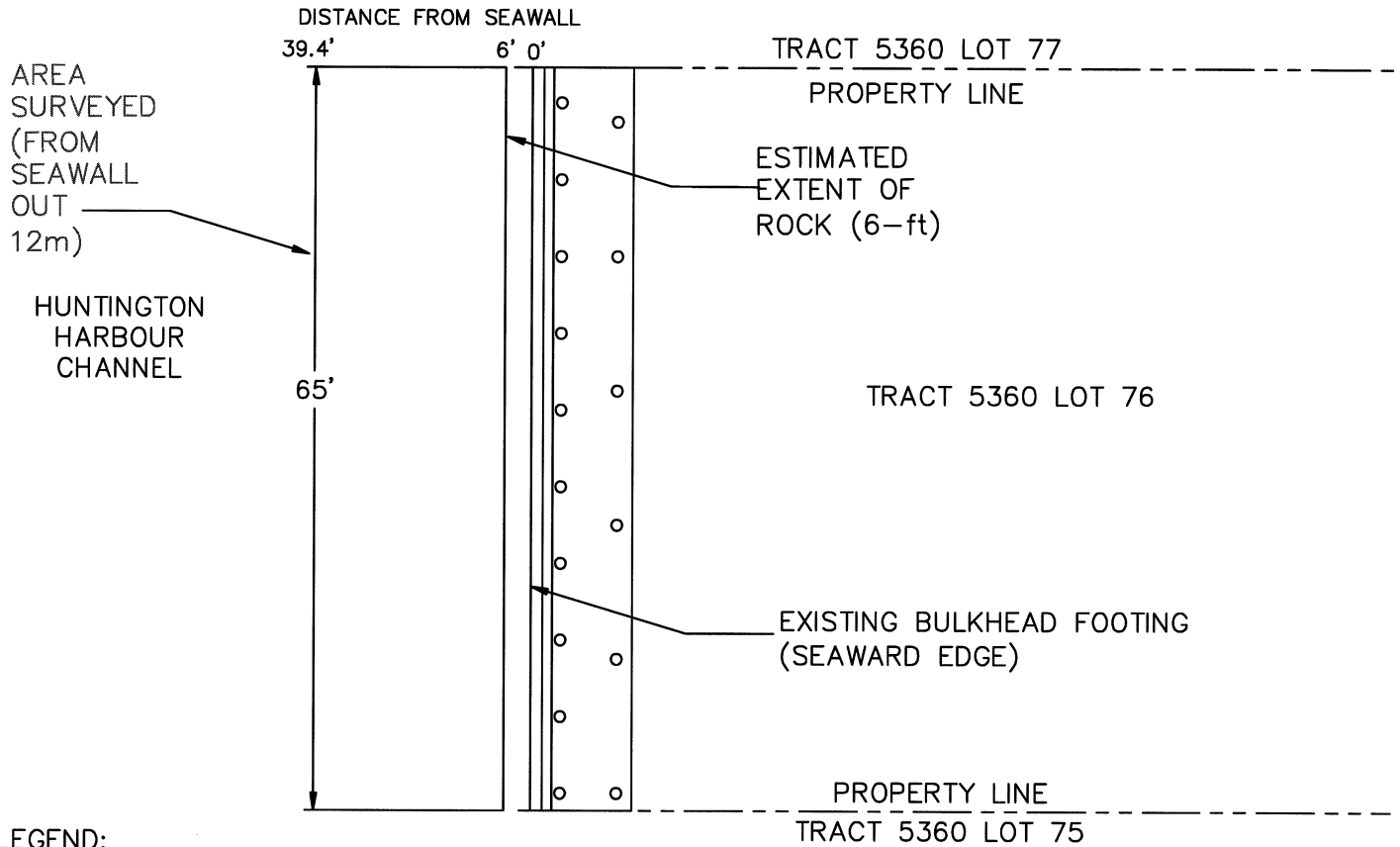
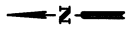
Leigh Ross  
4021 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 5360 Lot 75

ATTACHMENT NO. 10.34



**LEGEND:**

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

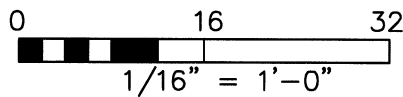


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

**PLAN VIEW**



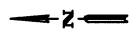
Thera Fae Wood  
4031 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5360 Lot 76

ATTACHMENT NO. 10.35



DISTANCE FROM SEAWALL

39.4'

6' 0"

TRACT 5360 LOT 78

PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

HUNTINGTON  
HARBOUR  
CHANNEL

50'-5"

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

TRACT 5360 LOT 77

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

PROPERTY LINE

TRACT 5360 LOT 76

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

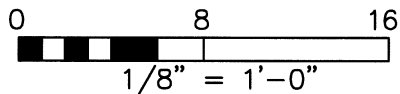


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



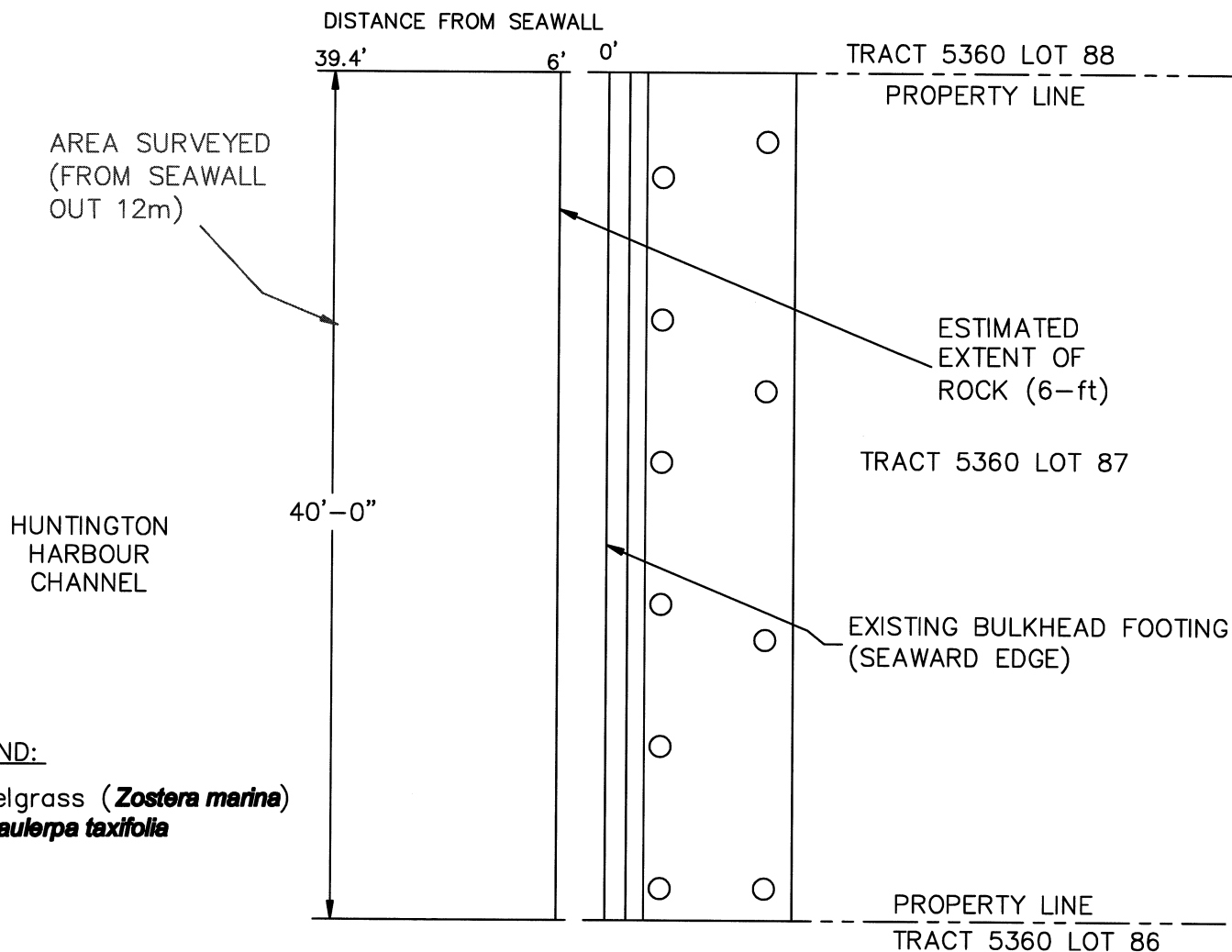
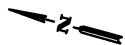
Lois Lacy  
4041 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5360 Lot 77

ATTACHMENT NO. 10.36



LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

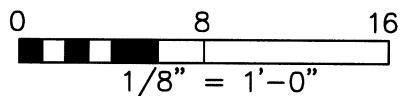


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



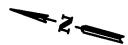
Ralph Thorne  
4141 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5360 Lot 87

ATTACHMENT NO. 10.37



AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

HUNTINGTON  
HARBOUR  
CHANNEL

DISTANCE FROM SEAWALL

39.4'

6'

0'

40'-1"

TRACT 5360 LOT 89

PROPERTY LINE

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

TRACT 5360 LOT 88

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

PROPERTY LINE

TRACT 5360 LOT 87

LEGEND:

No Eelgrass (*Zostera marina*)

No *Caulerpa taxifolia*

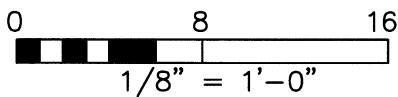


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



Ken & Karen Kawaguchi  
4151 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 5360 Lot 88

ATTACHMENT NO. 10.38



DISTANCE FROM SEAWALL

39.4'

6' 0"

TRACT 5360 LOT 90

PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

HUNTINGTON  
HARBOUR  
CHANNEL

50'-0"

TRACT 5360 LOT 89

EXISTING BULKHEAD  
FOOTING  
(SEAWARD EDGE)

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

PROPERTY LINE

TRACT 5360 LOT 88

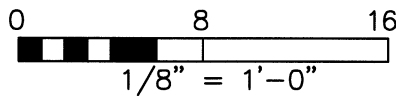


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



R. Bruce Rieser  
4171 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 5360 Lot 89

ATTACHMENT NO. 10.39





DISTANCE FROM SEAWALL

39.4'

6'

0'

TRACT 5360 LOT 91

PROPERTY LINE

AREA SURVEYED  
(FROM SEAWALL  
OUT 12m)

HUNTINGTON  
HARBOUR  
CHANNEL

50'-0"

ESTIMATED  
EXTENT OF  
ROCK (6-ft)

TRACT 5360 LOT 90

EXISTING BULKHEAD FOOTING  
(SEAWARD EDGE)

LEGEND:

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

PROPERTY LINE

TRACT 5360 LOT 89

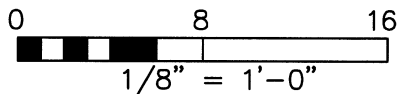


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



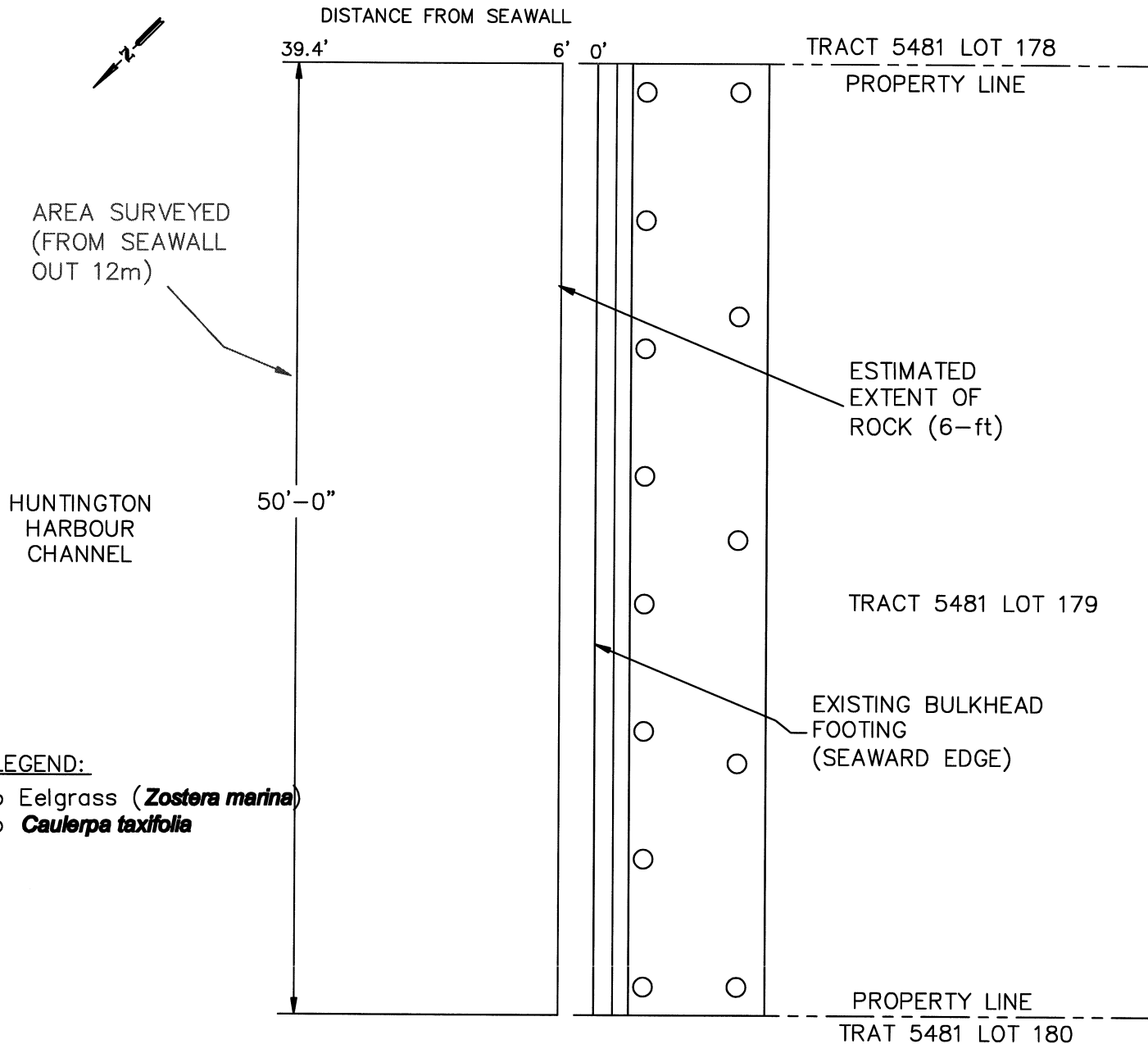
Dick & Joyce Opdahl  
4181 Morning Star Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

tract 5360 Lot 90

ATTACHMENT NO. 10.40



**LEGEND:**

No Eelgrass (*Zostera marina*)  
 No *Caulerpa taxifolia*

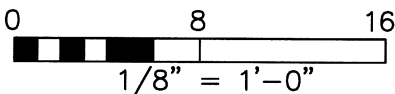


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
 Long Beach, CA 90802  
 (562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



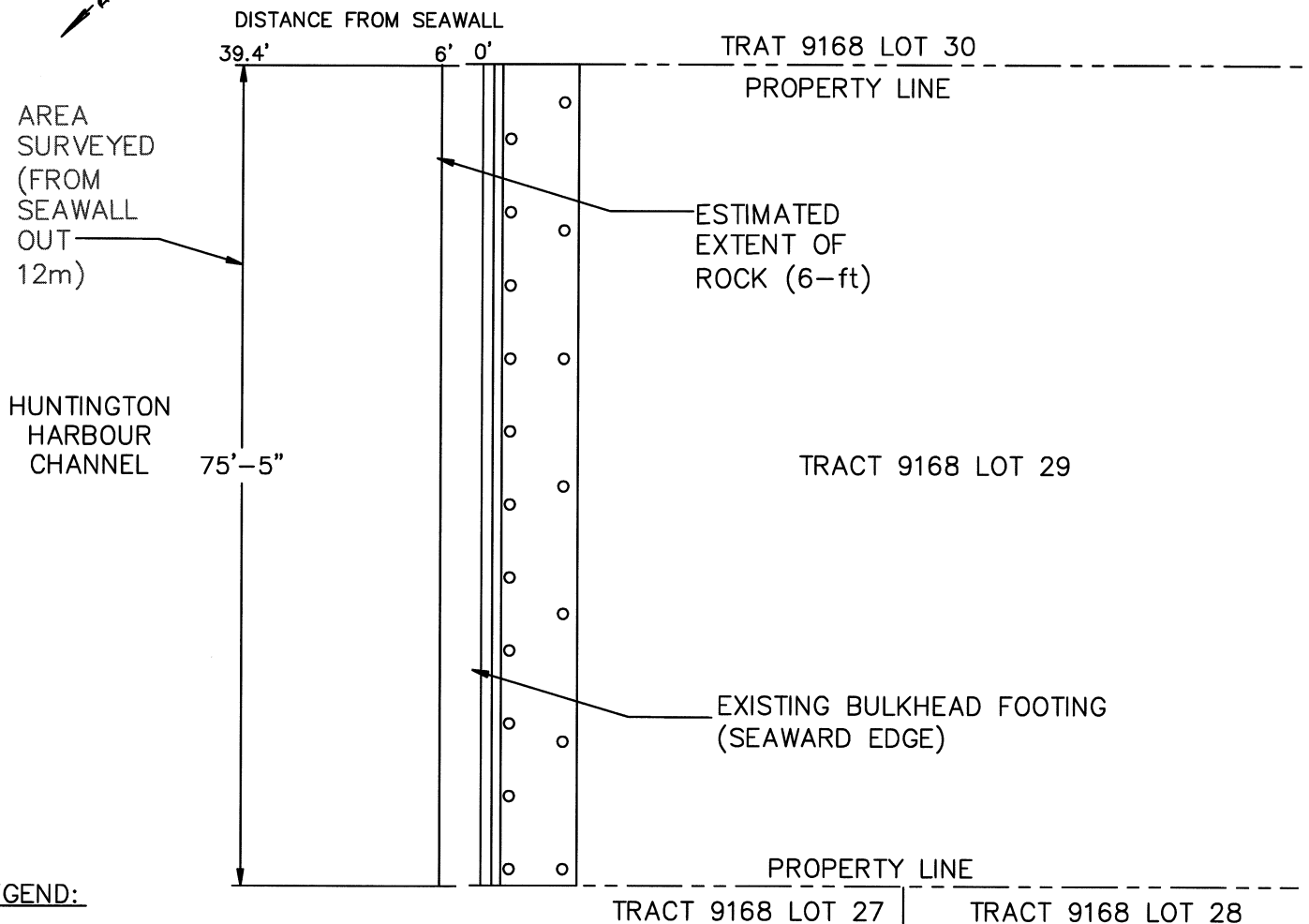
Carrie Preston  
 16572 Ensign Circle  
 Huntington Beach, CA 92649

Eelgrass Survey Results  
 Survey Conducted: 05/23/08

IN: Huntington Harbour  
 AT: Huntington Beach  
 County of Orange State: CA

Tract 5481 Lot 179

ATTACHMENT NO. 10.41



**LEGEND:**

No Eelgrass (*Zostera marina*)  
No *Caulerpa taxifolia*

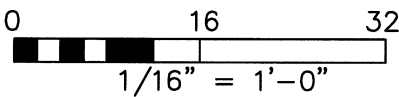


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



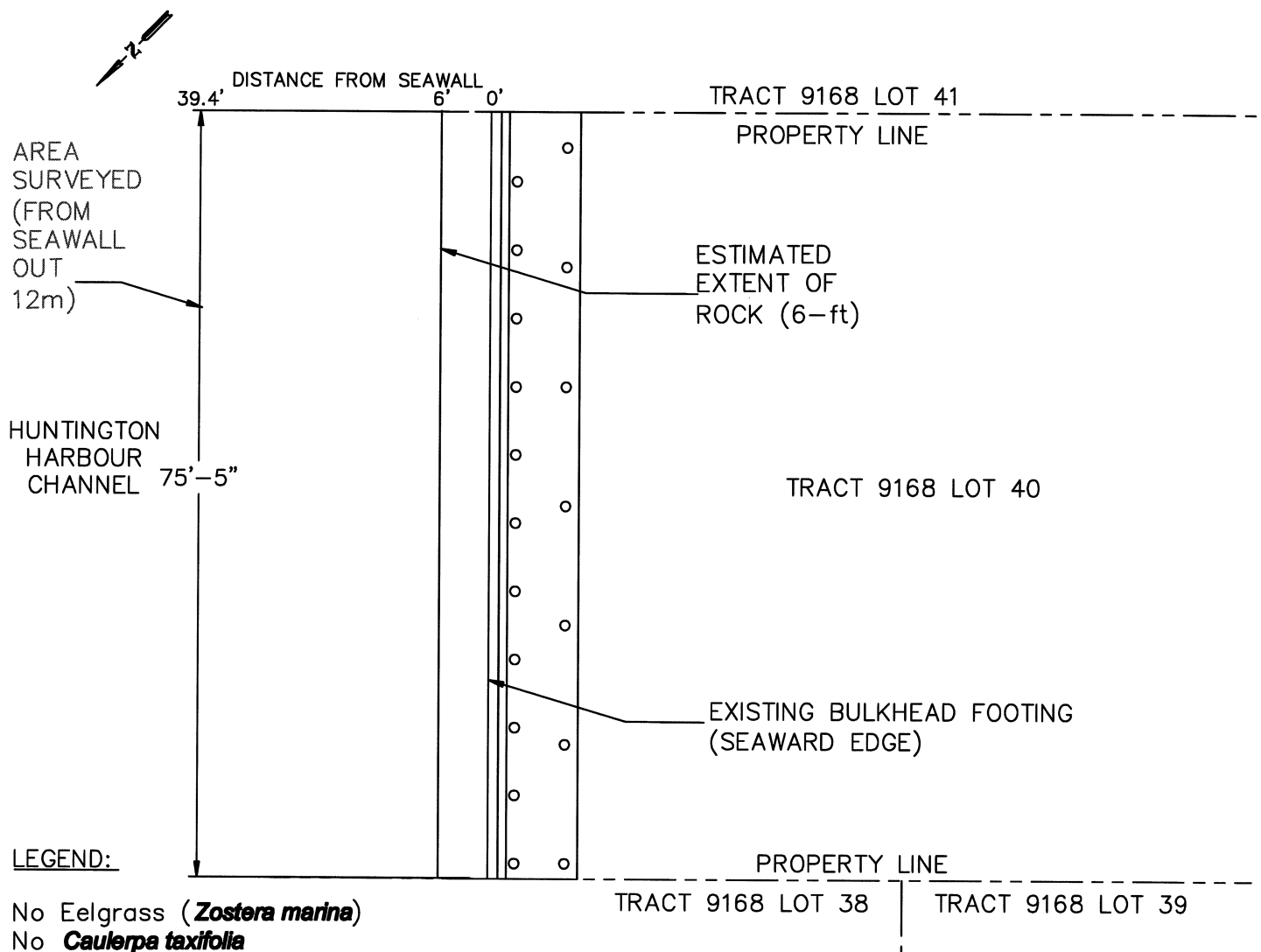
Thomas & Sandra Gallagher  
3781 Ragtime Circle  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 9168 Lot 29

ATTACHMENT NO. 10.42

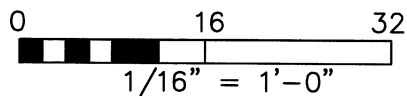


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



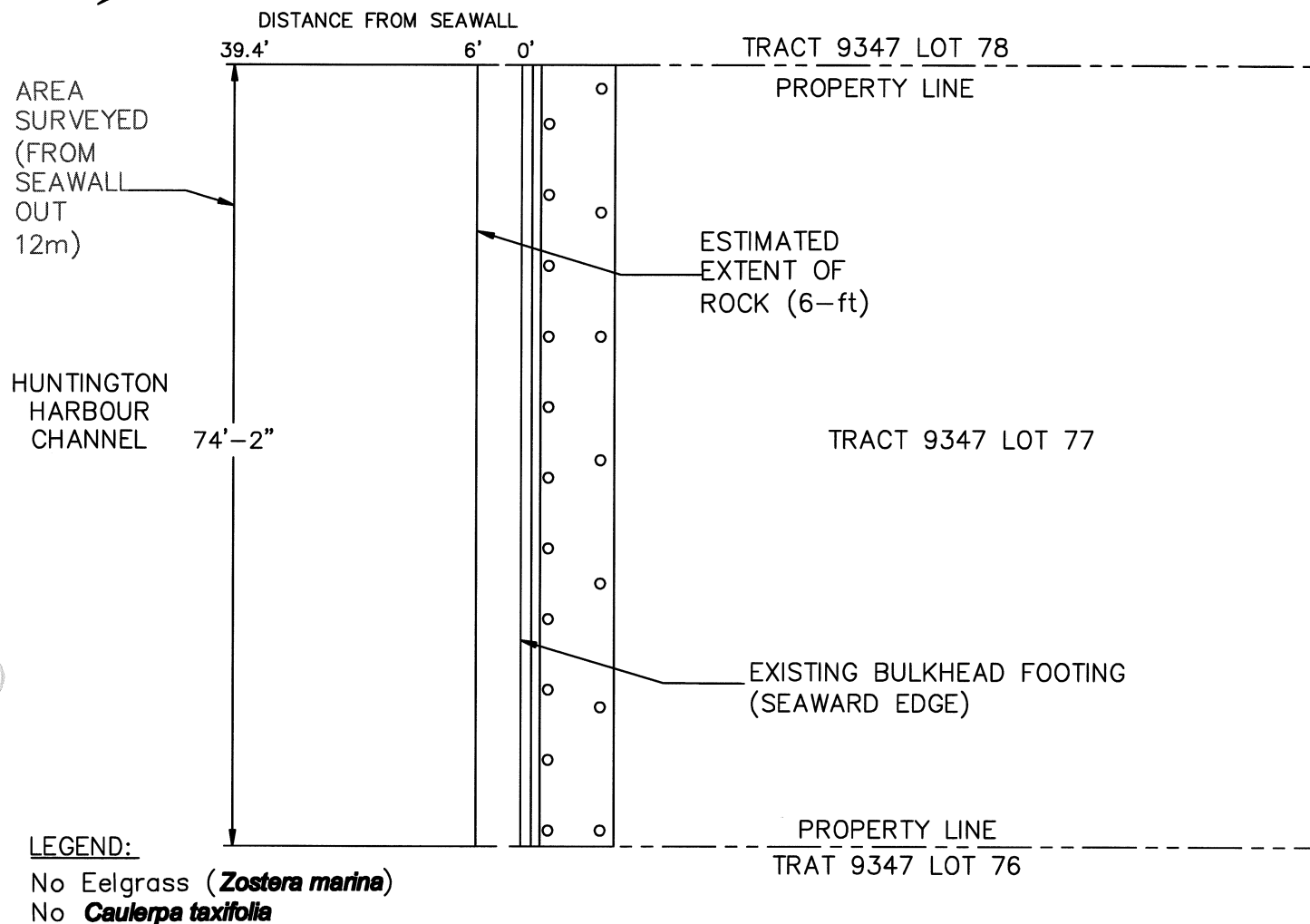
Elmer & Lincolna Malchow  
3741 Nimble Circle  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 9168 Lot 40

ATTACHMENT NO. 10.43

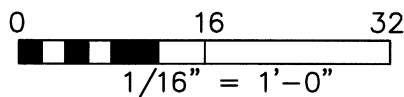


**TETRA TECH**

401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0495, Fax (562) 495-5029

Datum: MLLW = 0

PLAN VIEW



Vera J. Butler  
3481 Sagamore Drive  
Huntington Beach, CA 92649

Eelgrass Survey Results  
Survey Conducted: 05/23/08

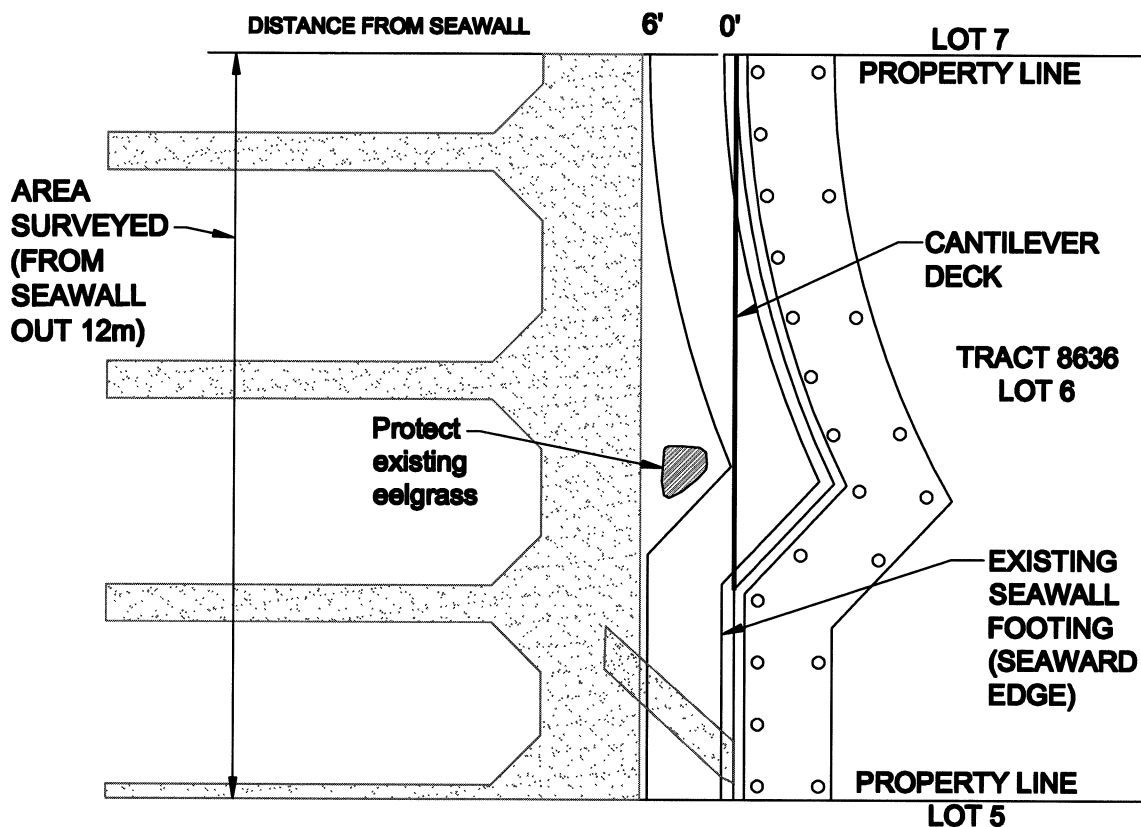
IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Tract 9347 Lot 77


ATTACHMENT NO. 10.44



HUNTINGTON HARBOUR CHANNEL




**LEGEND:**

 Eelgrass 05/24/08 (11ft sq)  
No *Caulerpa taxifolia*



**TETRA TECH**  
401 East Ocean Blvd., Suite 420  
Long Beach, CA 90802  
(562) 495-0496, Fax (562) 495-5029

Datum: MLLW = 0

**PLAN VIEW**  
0 15'  
  
1" = 15'

**Eelgrass Survey Results**  
Survey Conducted: 05/24/08

IN: Huntington Harbour  
AT: Huntington Beach  
County of Orange State: CA

Trinidad Island  
Tract 8636 Lot 6

Isaac Azoulay  
3432 Venture Drive  
Huntington Beach, CA 92649

ATTACHMENT NO. 10.45

**APPENDIX B**

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**Southern California Eelgrass Mitigation Policy (Rev. 11)**

ATTACHMENT NO. 10.46

# SOUTHERN CALIFORNIA EELGRASS MITIGATION POLICY

(Adopted July 31, 1991)

Eelgrass (Zostera marina) vegetated areas are recognized as important ecological communities in shallow bays and estuaries because of their multiple biological and physical values. Eelgrass habitat functions as an important structural environment for resident bay and estuarine species, offering both predation refuge and a food source. Eelgrass functions as a nursery area for many commercially and recreationally important finfish and shellfish species, including those that are resident within bays and estuaries, as well as oceanic species that enter estuaries to breed or spawn. Eelgrass also provides a unique habitat that supports a high diversity of non-commercially important species whose ecological roles are less well understood.

Eelgrass is a major food source in nearshore marine systems, contributing to the system at multiple trophic levels. Eelgrass provides the greatest amount of primary production of any nearshore marine ecosystem, forming the base of detrital-based food webs and as well as providing a food source for organisms that feed directly on eelgrass leaves, such as migrating waterfowl. Eelgrass is also a source of secondary production, supporting epiphytic plants, animals, and microbial organisms that in turn are grazed upon by other invertebrates, larval and juvenile fish, and birds.

In addition to habitat and resource attributes, eelgrass serves beneficial physical roles in bays and estuaries. Eelgrass beds dampen wave and current action, trap suspended particulates, and reduce erosion by stabilizing the sediment. They also improve water clarity, cycle nutrients, and generate oxygen during daylight hours.

In order to standardize and maintain a consistent policy regarding mitigating adverse impacts to eelgrass resources, the following policy has been developed by the Federal and State resource agencies (National Marine Fisheries Service, U.S. Fish and Wildlife Service, and the California Department of Fish and Game). While the intent of this Policy is to provide a basis for consistent recommendations for projects that may impact existing eelgrass resources, there may be circumstances (e.g., climatic events) where flexibility in the application of this Policy is warranted. As a consequence, deviations from the stated Policy may be allowed on a case-by-case basis. This policy should be cited as the Southern California Eelgrass Mitigation Policy (revision 11).

For clarity, the following definitions apply. "Project" refers to work performed on-site to accomplish the applicant's purpose. "Mitigation" refers to work performed to compensate for any adverse impacts caused by the "project". "Resource agencies" refers to National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (CDFG).

**1. Mitigation Need.** Eelgrass transplants shall be considered only after the normal provisions and policies regarding avoidance and minimization, as addressed in the Section 404 Mitigation Memorandum of Agreement between the Corps of Engineers and Environmental Protection Agency, have been pursued to the fullest extent possible prior to the development of any mitigation program. Mitigation will be required for the loss of



existing vegetated areas, loss of potential eelgrass habitat, and/or degradation of existing/potential eelgrass habitat. Mitigation for boat docks and/or related work is addressed in section 2.

**2. Boat Docks and Related Structures.** Boat docks, ramps, gangways and similar structures should avoid eelgrass vegetated or potential eelgrass vegetated areas to the maximum extent feasible. If avoidance of eelgrass or potential eelgrass areas is infeasible, impacts should be minimized by utilizing, to the maximum extent feasible, construction materials that allow for greater light penetration (e.g., grating, translucent panels, etc.). For projects where the impact cannot be determined until after project completion (i.e., vessel shading, vessel traffic) a determination regarding the amount of mitigation shall be made based upon two annual monitoring surveys conducted during the time period of August to October which document the changes in the bed (areal extent and density) in the vicinity of the footprint of the boat dock, moored vessel(s), and/or related structures. Any impacts determined by these monitoring surveys shall be mitigated per sections 3-12 of this policy. Projects subject to this section must include a statement from the applicant indicating their understanding of the potential mitigation obligation which may follow the initial two-year monitoring.

**3. Mitigation Map.** The project applicant shall map thoroughly the area, distribution, density and relationship to depth contours of any eelgrass beds likely to be impacted by project construction. This includes areas immediately adjacent to the project site which have the potential to be indirectly or inadvertently impacted as well as potential eelgrass habitat areas. Potential habitat is defined as areas where eelgrass would normally be expected to occur but where no vegetation currently exists. Factors to be considered in delineating potential habitat areas include appropriate circulation, light, sediment, slope, salinity, temperature, dissolved oxygen, depth, proximity to eelgrass, history of eelgrass coverage, etc.

Protocol for mapping shall consist of the following format:

1) Bounding Coordinates

Horizontal datum - Universal Transverse Mercator (UTM), NAD 83, Zone 11 is the preferred projection and datum. If another projection or datum is used, the map and spatial data must include metadata that accurately defines the projection and datum.

Vertical datum - Mean Lower Low Water (MLLW), depth in feet.

2) Units

Transects and grids in meters.

Area measurements in square meters/hectares.

3) File format

A spatial data layer compatible with readily available geographic information system software must be sent to NMFS and any other interested resource agency when the area mapped has greater than 10 square meters of

eelgrass. For those areas with less than 10 square meters, a table must be provided giving the bounding x,y coordinates of the eelgrass areas. In addition to a spatial layer or table, a hard-copy map should be included within the survey report. The projection and datum should be clearly defined in the metadata and/or an associated text file.

All mapping efforts must be completed during the active growth phase for the vegetation (typically March through October) and shall be valid for a period of 60 days with the exception of surveys completed in August - October. Surveys completed after unusual climatic events (i.e., high rainfall) may have modified requirements and surveyors should contact NMFS, CDFG, and USFWS to determine if any modifications to the standard survey procedures will be required. A survey completed in August - October shall be valid until the resumption of active growth (i.e., in most instances, March 1). After project construction, a post-project survey shall be completed within 30 days. The actual area of impact shall be determined from this survey.

**4. Mitigation Site.** The location of eelgrass transplant mitigation shall be in areas similar to those where the initial impact occurs. Factors such as, distance from project, depth, sediment type, distance from ocean connection, water quality, and currents are among those that should be considered in evaluating potential sites.

**5. Mitigation Size.** In the case of transplant mitigation activities that occur concurrent to the project that results in damage to the existing eelgrass resource, a ratio of 1.2 to 1 shall apply. That is, for each square meter adversely impacted, 1.2 square meters of new suitable habitat, vegetated with eelgrass, must be created. The rationale for this ratio is based on, 1) the time (i.e., generally three years) necessary for a mitigation site to reach full fishery utilization and 2) the need to offset any productivity losses during this recovery period within five years. An exception to the 1.2 to 1 requirement shall be allowed when the impact is temporary and the total area of impact is less than 100 square meters. Mitigation on a one-for-one basis shall be acceptable for projects that meet these requirements (see section 11 for projects impacting less than 10 square meters).

Transplant mitigation completed three years in advance of the impact (i.e., mitigation banks) will not incur the additional 20 percent requirement and, therefore, can be constructed on a one-for-one basis. However, all other annual monitoring requirements (see sections 8-9) remain the same irrespective of when the transplant is completed.

Project applicants should consider increasing the size of the required mitigation area by 20-30 percent to provide greater assurance that the success criteria, as specified in Section 10, will be met. In addition, alternative contingent mitigation must be specified, and included in any required permits, to address situation where performance standards (see section 10) are not likely to be met.

For potential eelgrass habitat, a ratio of 1 to 1 of equivalent habitat shall be created.

Degradation of existing eelgrass vegetated habitat that results in a reduction of density greater than 25 percent shall be mitigated on a one-for-one basis. For example, a 25

percent reduction in density of a 100 square meter (100 turions/meter) eelgrass bed to 75 turions/meter would require the establishment of 25 square meters of new eelgrass with a density at or greater than the pre-impact density. All other provisions of the Policy would apply.

**6. Mitigation Technique.** Techniques for the construction and planting of the eelgrass mitigation site shall be consistent with the best available technology at the time of the project. Donor material shall be taken from the area of direct impact whenever possible, but also should include a minimum of two additional distinct sites to better ensure genetic diversity of the donor plants. No more than 10 percent of an existing bed shall be harvested for transplanting purposes. Plants harvested shall be taken in a manner to thin an existing bed without leaving any noticeable bare areas. Written permission to harvest donor plants must be obtained from the California Department of Fish and Game.

Plantings should consist of bare-root bundles consisting of 8-12 individual turions. Specific spacing of transplant units shall be at the discretion of the project applicant. However, it is understood that whatever techniques are employed, they must comply with the stated requirements and criteria.

**7. Mitigation Timing.** For off-site mitigation, transplanting should be started prior to or concurrent with the initiation of in-water construction resulting in the impact to the eelgrass bed. Any off-site mitigation project which fails to initiate transplanting work within 135 days following the initiation of the in-water construction resulting in impact to the eelgrass bed will be subject to additional mitigation requirements as specified in section 8. For on-site mitigation, transplanting should be postponed when construction work is likely to impact the mitigation. However, transplanting of on-site mitigation should be started no later than 135 days after initiation of in-water construction activities. A construction schedule which includes specific starting and ending dates for all work including mitigation activities shall be provided to the resource agencies for approval at least 30 days prior to initiating in-water construction.

**8. Mitigation Delay.** If, according to the construction schedule or because of any delays, mitigation cannot be started within 135 days of initiating in-water construction, the eelgrass replacement mitigation obligation shall increase at a rate of seven percent for each month of delay. This increase is necessary to ensure that all productivity losses incurred during this period are sufficiently offset within five years.

**9. Mitigation Monitoring.** Monitoring the success of eelgrass mitigation shall be required for a period of five years for most projects. Monitoring activities shall determine the area of eelgrass and density of plants at the transplant site and shall be conducted at initial planting, 6, 12, 24, 36, 48, and 60 months after completion of the transplant. All monitoring work must be conducted during the active vegetative growth period and shall avoid the winter months of November through February. Sufficient flexibility in the scheduling of the 6 month surveys shall be allowed in order to ensure the work is completed during this active growth period. Additional monitoring beyond the 60 month period may be required in those instances where stability of the proposed transplant site is questionable or where other factors may influence the long-term success of transplant.

The monitoring of an adjacent or other acceptable control area (subject to the approval of the resource agencies) to account for any natural changes or fluctuations in bed width or density must be included as an element of the overall program.

A monitoring schedule that indicates when each of the required monitoring events will be completed shall be provided to the resource agencies prior to or concurrent with the initiation of the mitigation (see attached monitoring and compliance summary form).

Monitoring reports shall be provided to the resource agencies within 30 days after the completion of each required monitoring period and shall include the summary sheet included at the end of this policy.

**10. Mitigation Success.** Criteria for determination of transplant success shall be based upon a comparison of vegetation coverage (area) and density (turions per square meter) between the **adjusted project impact area** (i.e., original impact area multiplied by 1.2) and **mitigation site(s)**. Extent of vegetated cover is defined as that area where eelgrass is present and where gaps in coverage are less than one meter between individual turion clusters. Density of shoots is defined by the number of turions per area present in representative samples within the original impact area, control or transplant bed. Specific criteria are as follows:

- a. the mitigation site shall achieve a minimum of 70 percent area of eelgrass and 30 percent density as compared to the adjusted project impact area after the first year.
- b. the mitigation site shall achieve a minimum of 85 percent area of eelgrass and 70 percent density as compared to the adjusted project impact area after the second year.
- c. the mitigation site shall achieve a sustained 100 percent area of eelgrass bed and at least 85 percent density as compared to the adjusted project impact area for the third, fourth and fifth years.

Should the required eelgrass transplant fail to meet any of the established criteria, then a Supplementary Transplant Area (STA) shall be constructed, if necessary, and planted. The size of this STA shall be determined by the following formula:

$$STA = MTA \times (|A_t + D_t| - |A_c + D_c|)$$

MTA = mitigation transplant area.

$A_t$  = transplant deficiency or excess in area of coverage criterion (%).

$D_t$  = transplant deficiency in density criterion (%).

$A_c$  = natural decline in area of control (%).

$D_c$  = natural decline in density of control (%).

The STA formula shall be applied to actions that result in the degradation of habitat (i.e., either loss of areal extent or reduction in density).

Five conditions apply:

- 1) For years 2-5, an excess of only up to 30% in area of coverage over the stated criterion with a density of at least 60% as compared to the project area may be used to offset any deficiencies in the density criterion.
- 2) Only excesses in area criterion equal to or less than the deficiencies in density shall be entered into the STA formula.
- 3) Densities which exceed any of the stated criteria shall not be used to offset any deficiencies in area of coverage.
- 4) Any required STA must be initiated within 120 days following the monitoring event that identifies a deficiency in meeting the success criteria. Any delays beyond 120 days in the implementation of the STA shall be subject to the penalties as described in Section 8.
- 5) Annual monitoring will be required of the STA for five years following the implementation and all performance standards apply to the STA.

11. **Mitigation Bank.** Any mitigation transplant success that, after five years, exceeds the mitigation requirements, as defined in section 10, may be considered as credit in a "mitigation bank". Establishment of any "mitigation bank" and use of any credits accrued from such a bank must be with the approval of the resource agencies and be consistent with the provisions stated in this policy. Monitoring of any approved mitigation bank shall be conducted on an annual basis until all credits are exhausted.

12. **Exclusions.**

1) Placement of a single pipeline, cable, or other similar utility line across an existing eelgrass bed with an impact corridor of no more than 1 meter wide may be excluded from the provisions of this policy with concurrence of the resource agencies. After project construction, a post-project survey shall be completed within 30 days and the results shall be sent to the resource agencies. The actual area of impact shall be determined from this survey. An additional survey shall be completed after 12 months to insure that the project or impacts attributable to the project have not exceeded the allowed 1 meter corridor width. Should the post-project or 12 month survey demonstrate a loss of eelgrass greater than the 1 meter wide corridor, then mitigation pursuant to sections 1-11 of this policy shall be required.

2) Projects impacting less than 10 square meters. For these projects, an exemption may be requested by a project applicant from the mitigation requirements as stated in this policy, provided suitable out-of-kind mitigation is proposed. A case-by-case evaluation and determination regarding the applicability of the requested exemption shall be made by the resource agencies.

(last revised 08/30/05)

## Southern California Eelgrass Mitigation Policy Monitoring and Compliance Reporting Summary

### PERMIT DATA:

Permit (Type, Number)	Issuance Date	Expiration Date	Agency Contact
ACOE:			
CDP:			
Other:			

### EELGRASS IMPACT AND MITIGATION REQUIREMENTS SUMMARY:

Permitted Eelgrass Impact Estimate	(m <sup>2</sup> )	
Actual Eelgrass Impact	(m <sup>2</sup> )	(post-const. survey date)
Eelgrass Mitigation Requirement	(m <sup>2</sup> )	(mitigation plan ref.)
Impact Site Location		(location)
Impact Site Center Coordinates		(define projection and datum)
Mitigation Site Location		(location)
Mitigation Site Center Coordinates		(define projection and datum)

### PERMITTEE CONTACT INFORMATION:

Project Name	(same as permit ref.)
Permittee Information	(permittee name)
	(mailing address)
	(city, state, zip)
	(permittee contact)
Mitigation Consultant	(phone, fax., e-mail)
	(consultant contact)
	(phone, fax., e-mail)

### PROJECT ACTIVITY DATA:

Activity	Start Date	End Date	Reference Info.
<i>Eelgrass Impact</i>			
<i>Installation of Eelgrass Mitigation</i>			
<i>Initiation of Mitigation Monitoring</i>			

### MITIGATION STATUS DATA:

Mitigation Milestone	Scheduled Survey	Survey Date	Area (m <sup>2</sup> )	Density (turions/m <sup>2</sup> )	Reference Info.
<i>Requirement</i>					
<i>0-month</i>					
<i>6-month</i>					
<i>12-month</i>					
<i>24-month</i>					
<i>36-month</i>					
<i>48-month</i>					
<i>60-month</i>					

ATTACHMENT NO. 10.53

**FINAL ASSESSMENT:**

Was mitigation met?	
Were mitigation and monitoring performed timely?	
Was delay penalty required or were supplemental mitigation programs necessary?	

# Attachment No. 11

## Summary of Mitigation Measures

<u>Description of Impact</u>	<u>Mitigation Measure</u>
<u>Hydrology &amp; Water Quality</u> <ul style="list-style-type: none"> <li>♦ Violate any water quality standards or waste discharge requirements</li> <li>♦ Otherwise substantially degrade water quality</li> </ul>	<p><b>HYDRO-1:</b> During all phases of the project, Best Management Practices (BMPs) will be implemented to prevent and control turbidity. BMPs may include the installation of a silt curtain.</p> <p><b>HYDRO-2:</b> If turbidity is observed at a distance of 100 feet or greater from the actual work site, either the work will be stopped until the water returns to normal or, if deemed necessary, a silt curtain will be installed until turbidity returns to normal.</p>
<u>Biological Resources</u> <ul style="list-style-type: none"> <li>♦ Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service</li> <li>♦ Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service</li> <li>♦ Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites</li> </ul>	<p><b>BIO-1:</b> An anchor management plan shall be prepared and implemented to avoid damage to eelgrass.</p> <p><b>BIO-2:</b> A pre-construction eelgrass survey shall be conducted to confirm that no impacts to eelgrass will occur within the area of construction as a result of the project.</p> <p><b>BIO-3:</b> Any reduction in acreage of eelgrass habitat shall be mitigated according to State and Federal environmental policies, which include the in-kind replacement of habitat.</p> <p><b>BIO-4:</b> The 11 properties requiring sheet pile installation, and impacting 401.5 square feet of soft bottom habitat, shall participate in the Soft Bottom Mitigation Plan, as approved by the California Coastal Commission under Coastal Development Permit 5-01-020. Confirmation from the California Department of Fish and Game (CDFG) shall be provided to ensure the availability of credits in the "mitigation bank" for the required square footage to be mitigated for the project. In the event that sufficient credit is unavailable, the applicant must mitigate the impacted area of soft bottom habitat at a 2:1 ratio. Any new mitigation plan shall be approved by the CDFG and the California Coastal Commission.</p>